

CHAPTER 7

MAINTENANCE OF LAUNCHING-HANDLING RAIL

Section I. GENERAL

103. Scope

This chapter contains maintenance information covering the launching-handling rail (fig. 218) that is within the scope of direct and general support personnel. The scope of maintenance is determined by the listing of parts in TM 9-1440-250-15P/1/1 and the listing of special tools for direct and general support personnel in SC 4935-92-CL-011.

104. References

Organizational maintenance of the launching-handling rail is covered in TM 9-1440-250-20/1. Schematic diagrams are furnished in TM 9-1440-250-20/2 and wiring lists are provided in TM 9-1440-250-35/1. General maintenance procedures are given in Chapter 4. Individual references to Chapter 4 are not made within this chapter. It is therefore especially important

that personnel become familiar with the contents of Chapter 4.

105. General Precautions

The precautions in *a* and *b* below must be observed when performing any maintenance on the launching-handling rail.

a. Disconnect the launching-handling rail electrically from the launcher erecting beam or the loading rack test station by disconnecting the two rail power cable assemblies (fig. 224) and connecting them to the two connector shells provided on the rail.

b. When the launching-handling rail (fig. 4) is installed on a Hercules monorail launcher, check that the MISSILE HYDR switch on the launcher control-indicator is in the OFF position and that the LAUNCHER switch is in the DOWN position.

Section II. MAINTENANCE OF LAUNCHING-HANDLING RAIL BODY

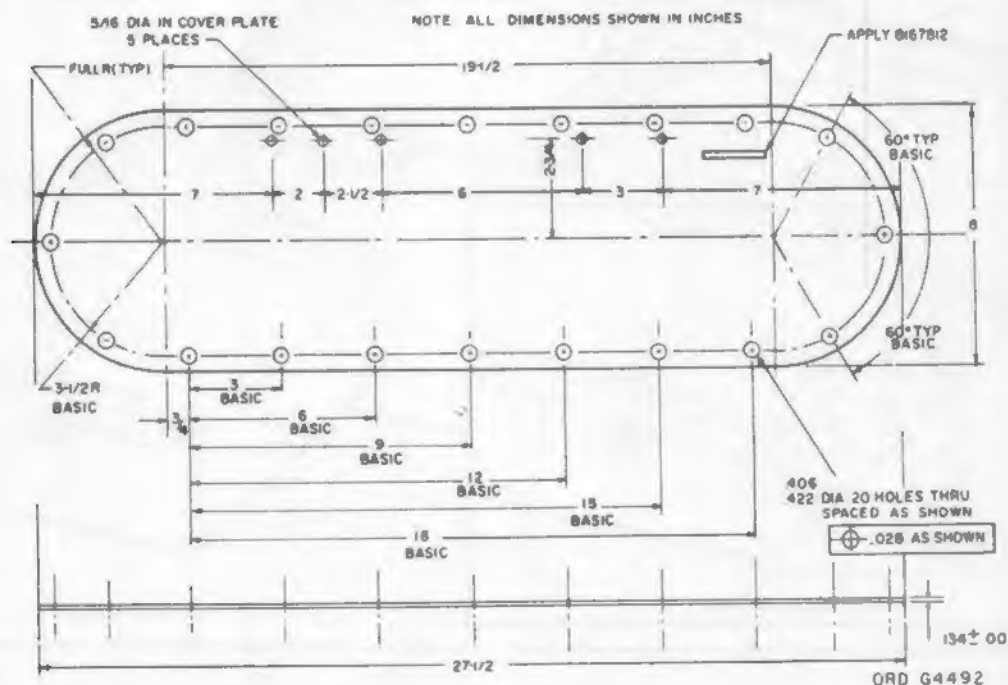
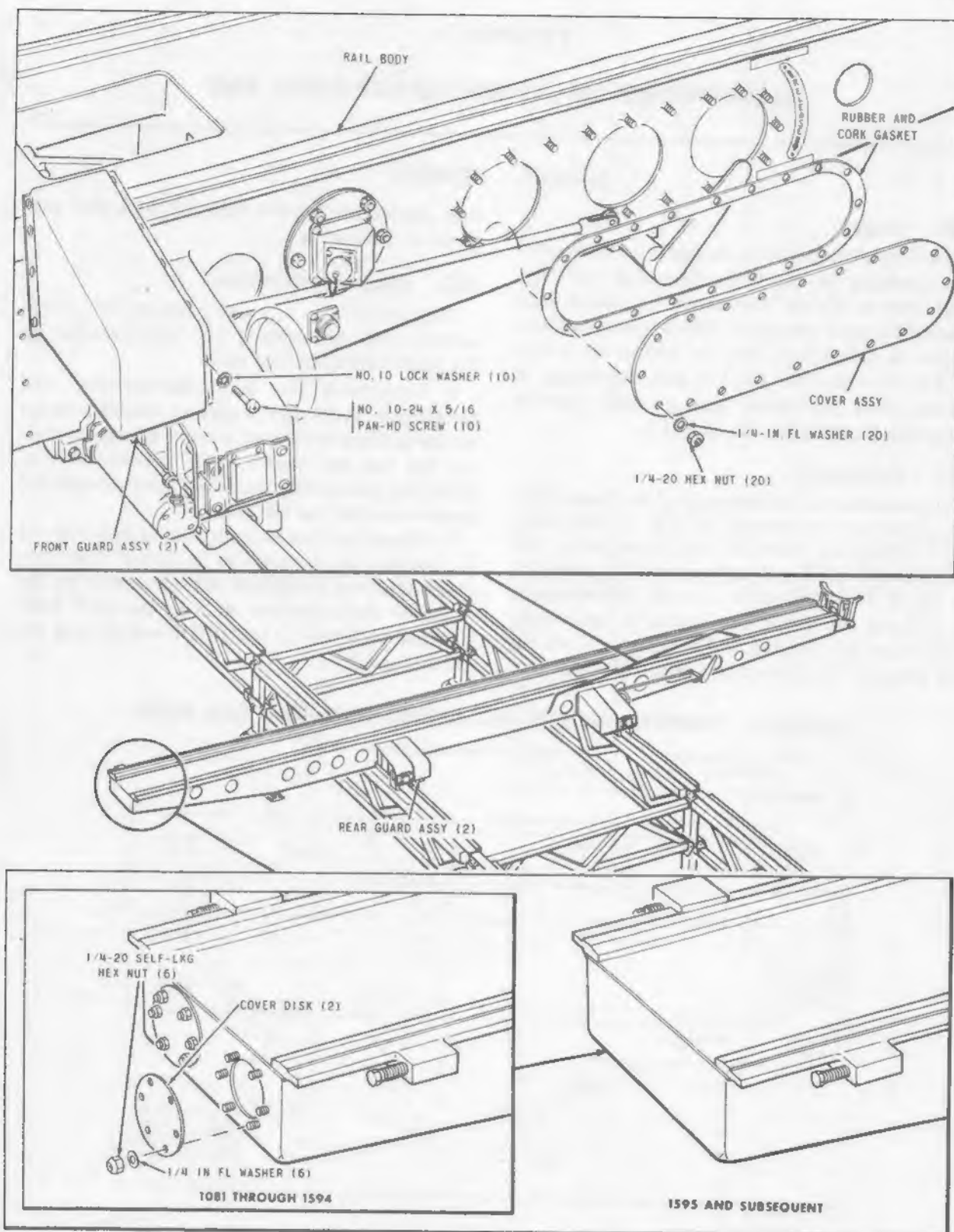


Figure 218.1. Drilling of Cover Assembly.



ORD G55657A

Figure 219. Guard assembly, cover disk, and cover assembly — removal and installation.

106. General

This section describes maintenance of the cover assembly (fig. 219), four guard assemblies, and two cover disks. The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

107. (Deleted)

108. Cover Assembly

A cover assembly (fig. 219) is attached to the right side of the rail body in front of the front guard assembly on the right.

a. Removal. Remove the cover assembly and the gasket.

b. Replacement of Broken Studs. If three or more consecutive studs of the upper seven are broken off, replace the broken studs as instructed in (1) through (12) below. Replace any other broken studs as indicated in (13) below.

- (1) Scribe a centerline lengthwise on the cover. Scribe a parallel line 2-1/2 inches above this centerline. From left to right, scribe vertical lines on this parallel line at 7, 9, 11-1/2, 17-1/2, and 20-1/2 inches. Center punch these locations for the new holes as shown in figure 218.1.
- (2) Using a 17/64 drill bit, drill five holes in the cover.
- (3) After the drilling operation, remove all burrs.
- (4) Replace the cover, centrally locate it over the existing studs, and secure it with the retaining nuts. Using the previously drilled holes in the cover as a guide, drill five 17/64 diameter holes in the rail body.
- (5) Remove the cover and enlarge the holes in the rail with a Q-size drill.
- (6) Thread these five holes in the rail body with a 3/8-24, #2 starting tap.

Insure that the tapped holes are vertical to the rail surface.

- (7) Install insert 9020619 leaving approximately 1/32-inch of the keyed slot-end protruding outside the surface of the rail.
- (8) Install lockring 9020630 into the keyed slot of the insert. (Use care to prevent driving the insert through the rail body.
- (9) Install the 3/8-24 jamnut on the exposed end of the insert inside the rail body.
- (10) Using the cover as a template, cut five new holes in the gasket.
- (11) Fill unused holes in the cover with a suitable filler material and repaint.
- (12) Reassemble the gasket and cover.
- (13) If any studs other than the five referenced above are broken off, drill out the defective studs and replace them with the insert, lockring, washer, and capscrew.

c. Installation. Install the gasket and cover assembly using the 1/4-28 x 3/4 capscrew and the 1/4-in-id flat washer where inserts have been installed.

109. Guard Assembly

Two front and two rear guard assemblies (fig. 219) are mounted on the four outriggers on the rail body.

a. Removal. Remove the guard assembly.

b. Installation. Install the guard assembly.

110. Cover Disk

Two cover disks (fig. 219) are mounted on the rear end of the rail body on rail units 1081 through 1594.

a. Removal. Remove the disk.

b. Installation. Install the disk.

Section III. MAINTENANCE OF LAUNCHING-HANDLING RAIL ELECTRICAL SYSTEM

111. General

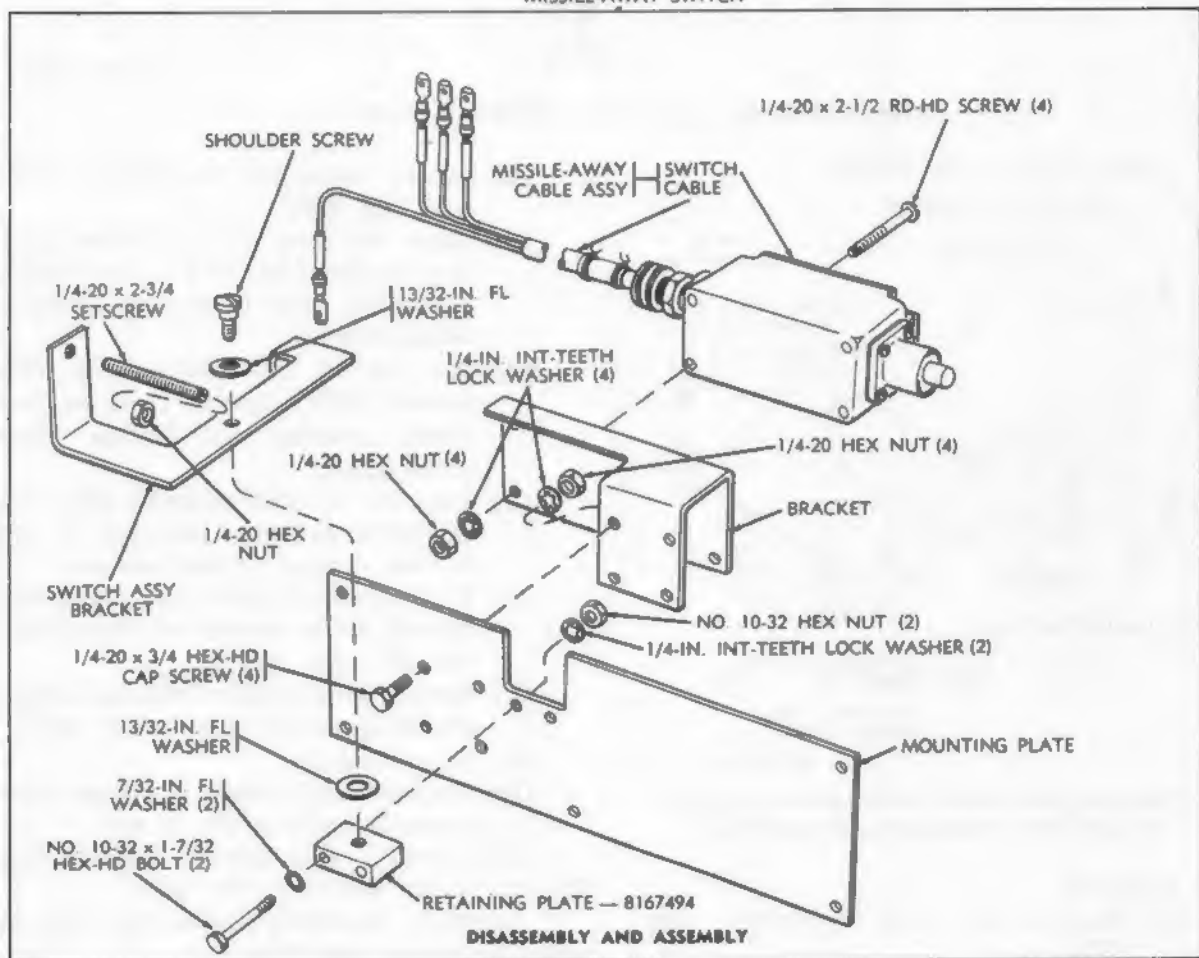
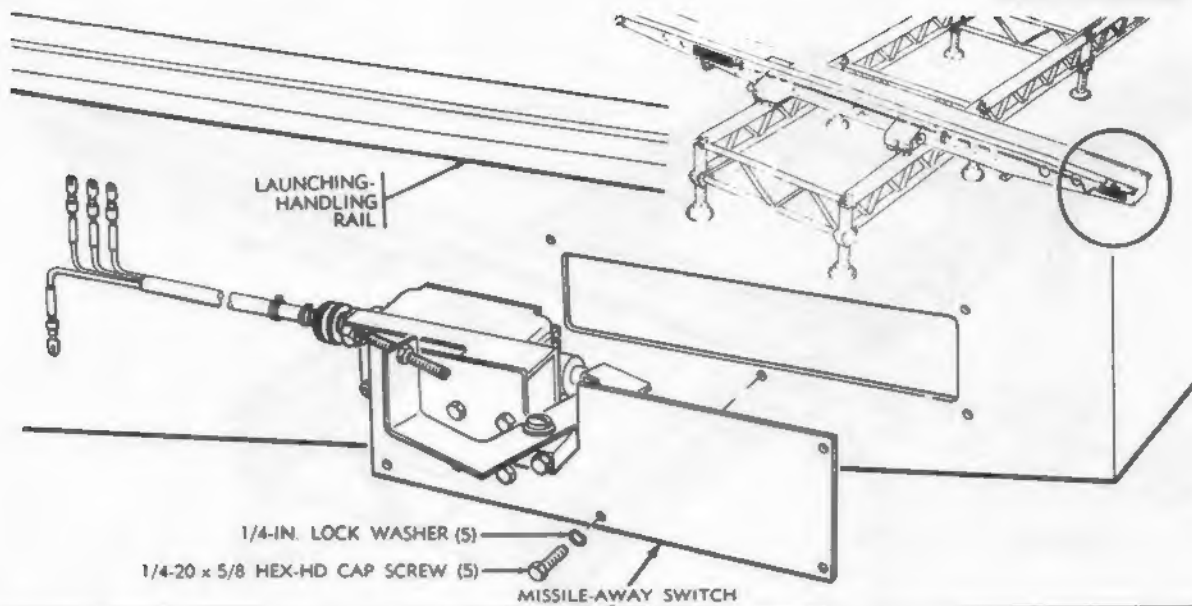
This section describes maintenance of the components of the launching-handling rail electrical system. The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

Caution: To insure proper cable connections,

perform continuity checks after each cable is installed.

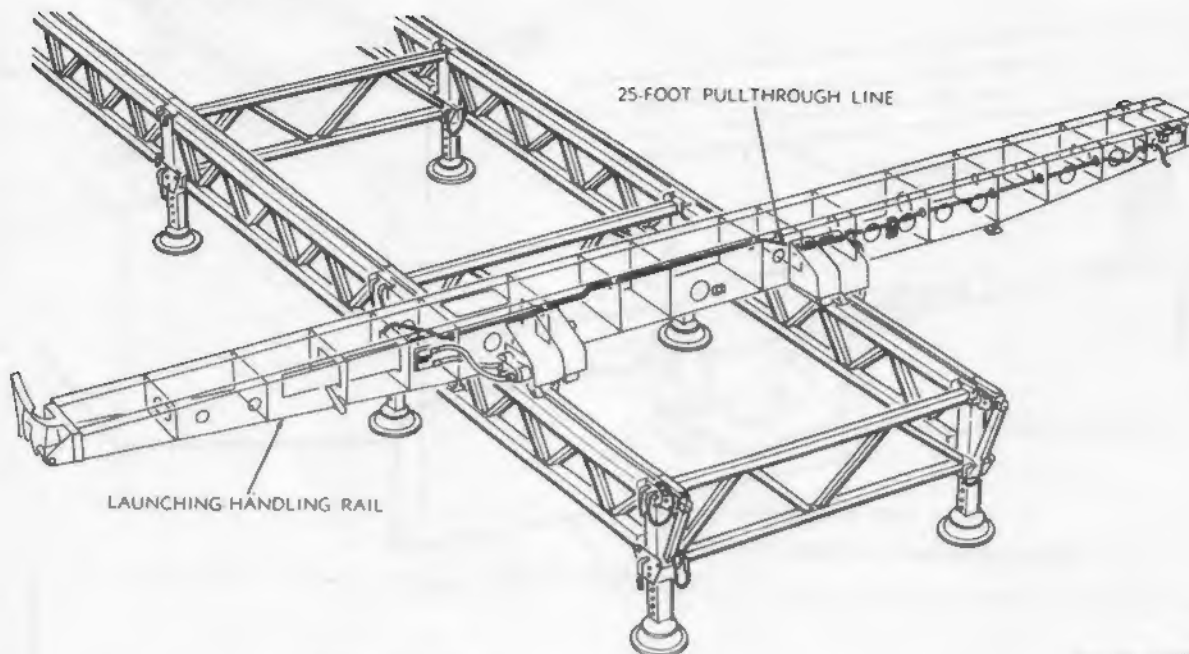
112. Missile-Away Switch

The missile-away switch (fig. 220), mounted on the left rear of the launching-handling rail, includes a missile-away cable assembly which extends to the terminal board group (fig. 218).



RA PD 463885A

Figure 220. Missile-away switch (1090 and subsequent)—
removal and installation.



RA PD 464084

Figure 221. Missile-away switch—pullthrough line location.

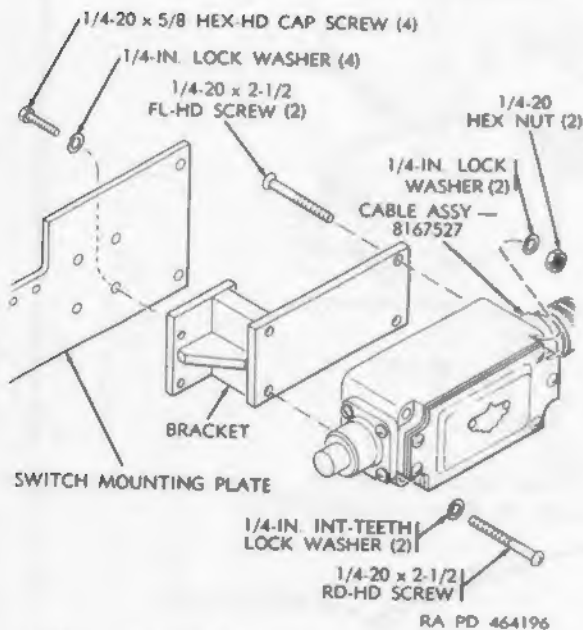


Figure 222. Missile-away switch assembly (1081 through 1089)—disassembly and assembly.

a. Removal.

- (1) Remove the cover assembly (fig. 219).

- (2) Loosen connector assembly in bulk-head (fig. 223).

- (3) Tape one end of a 25-foot pullthrough line (fig. 221) approximately 18 inches back from first terminal breakout point.

- (4) Tie line in half-hitches (fig. 84) around cable assembly three or four times, spacing half-hitches three inches apart.

- (5) Tape line to cable assembly after last half-hitch and tape terminals to line to form a taper at terminal end.

- (6) Tie free end of line to any convenient part of rail to prevent accidental pullthrough (fig. 221).

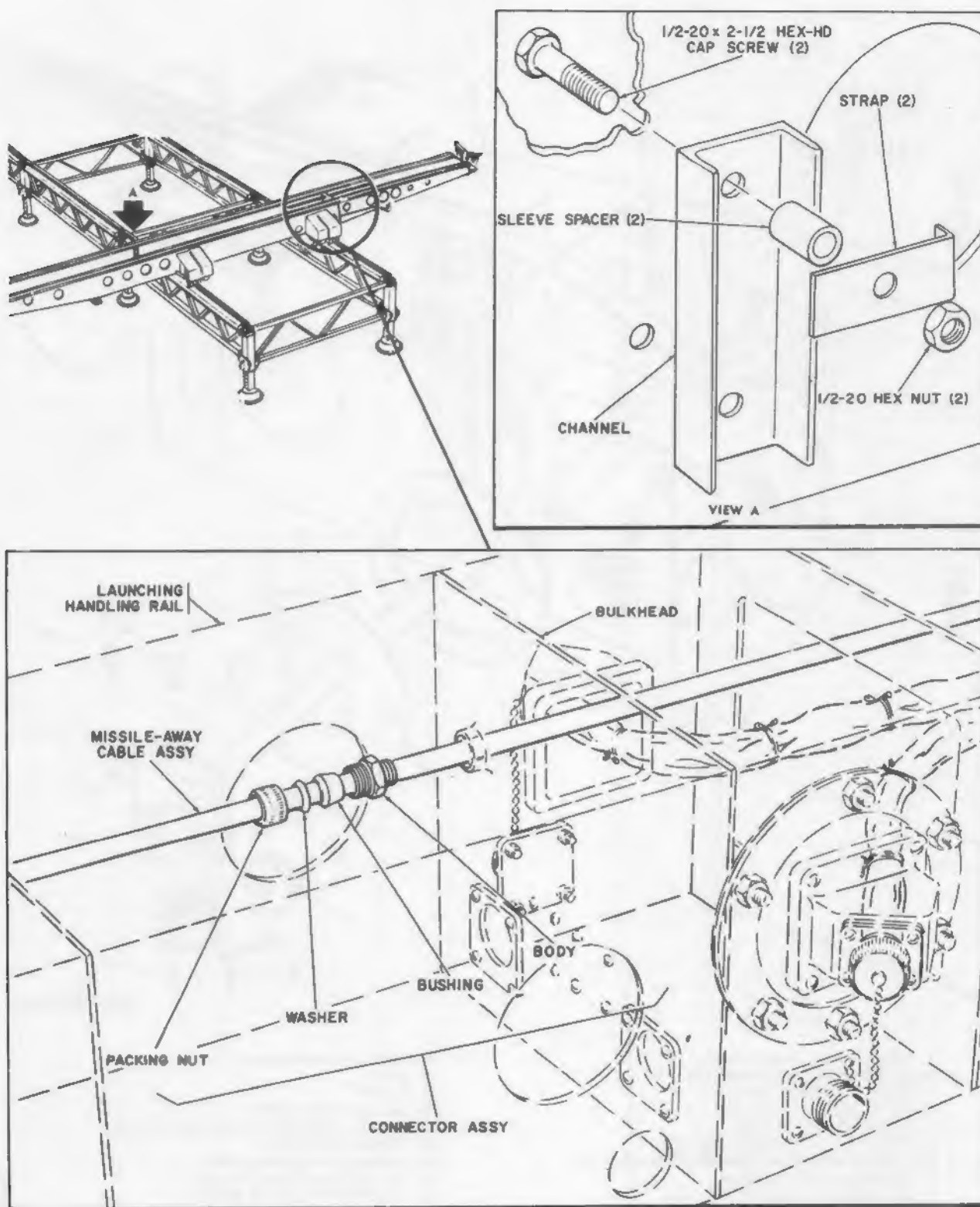
- (7) Remove five hexagon-head cap screws attaching switch to rail (fig. 220).

- (8) Remove switch.

- (9) Separate pullthrough line from cable assembly, leaving line in rail.

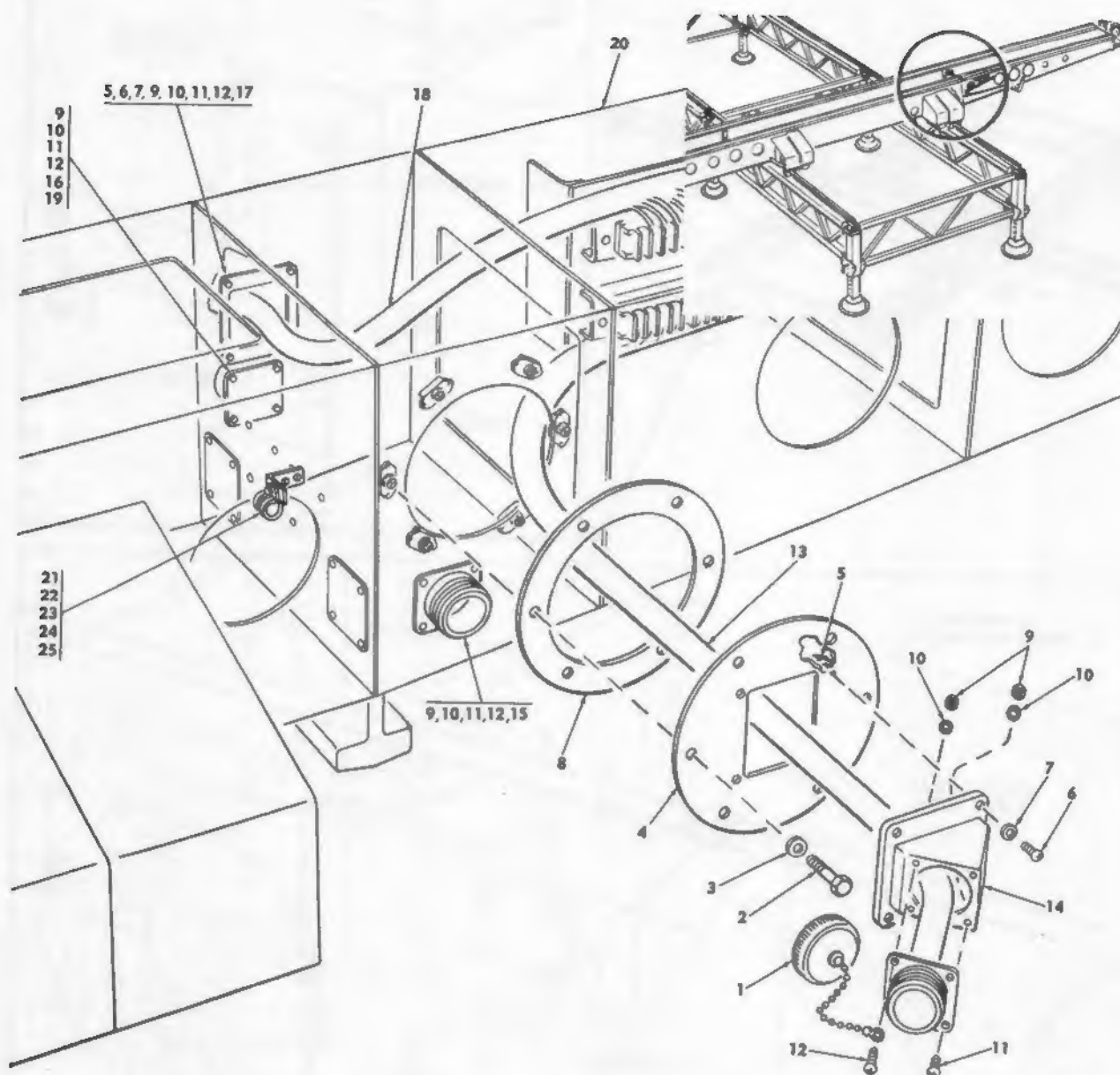
b. Disassembly. Disassemble switch (fig. 220) or switch assembly (fig. 222).

c. Assembly. Assemble switch (fig. 220) or switch assembly (fig. 222).



ORD 63374941

Figure 223. Missile-away cable assembly and channel—removal and installation.



ORD 63374958

- 1-Electrical connector cover
- 2- $\frac{1}{4}$ -28 hex-hd. cap screw (6)
- 3- $\frac{1}{4}$ -in. fl. washer (6)
- 4-Cover plate
- 5-No. 10-32 hex. nut (4)
- 6-No. 10-32 x $\frac{3}{4}$ rd-hd screw (4)
- 7-0.203 id x 0.438 od nonmetallic washer (4)
- 8-Rubber and cork gasket
- 9-No. 8-32 hex. nut (4)
- 10-No. 8 fl. washer (4)
- 11-No. 8-32 x $\frac{5}{8}$ rd-hd screw (3)
- 12-No. 8-32 x $\frac{3}{4}$ rd-hd screw
- 13-Missile umbilical cable assy

- 14-Conduit outlet cover
- 15-Shell
- 16-Cover
- 17-Conduit outlet cover
- 18-Missile umbilical wiring harness assy
- 19-Dummy connector
- 20-Launching-handling rail
- 21-No. 10-32 self-1kg hex. nut
- 22-No. 10-32 x $\frac{1}{2}$ fl-hd screw
- 23-1-in-id cable clamp (2)
- 24-No. 10-32 x $\frac{5}{8}$ fl-hd screw (2)
- 25-Angle bracket (2)

Figure 223.1. Missile umbilical cable assemblies, cover plate, and conduit outlet covers—removal and installation.

d. Installation.

- (1) Use the pullthrough line (fig. 221) in the launching-handling rail to tie three or four half-hitches (fig. 84) approximately 18 inches back from the end of the missile-away cable assembly (fig. 220).
- (2) Tape the end of the line to the cable assembly.
- (3) Tape the terminals to the pullthrough line to form a taper at the terminal end.
- (4) Pull the cable assembly through the rail (fig. 221), remove the tape, and untie the pullthrough line.
- (5) Refer to TM 9-1440-250-35/1 and make the proper wiring connections.
- (6) Install the cover assembly (fig. 219).
- (7) Tighten the connector assembly (fig. 223).
- (8) Install the switch on the rail (fig. 220).

e. Adjustment. Adjust the switch as outlined in TM 9-1440-250-20/1.

113. Missile Umbilical Cable Assemblies

The missile umbilical cable assembly (13, fig. 223.1) and the missile umbilical wiring harness assembly (18) are located inside the launching-handling rail (20). Both provide for external connections at the conduit outlet covers (14 and 17).

a. Removal.

- (1) Remove the cover assembly (fig. 219).
- (2) Remove the conduit outlet cover (14, fig. 223.1) and the cover plate (4).
- (3) Disconnect the electrical leads from the terminal blocks and remove the missile umbilical cable assembly (13).
- (4) Remove the conduit outlet cover (17).
- (5) Disconnect the electrical leads from the terminal blocks and remove the missile umbilical wiring harness assembly (18).
- (6) Remove the cable clamp and angle bracket (23 and 25).

b. Installation.

- (1) Install the conduit outlet cover (17) on the missile umbilical wiring harness assembly (18).

- (2) Install the missile umbilical wiring harness assembly.
- (3) Install the conduit outlet cover (14) on the cover plate (4) and install on the missile umbilical cable assembly (13).
- (4) Install the missile umbilical cable assembly.
- (5) Refer to TM 9-1440-250-35/1 and make the proper wiring connections.
- (6) Install the cable clamp and angle bracket (23 and 25).
- (7) Install the cover assembly (fig. 219).

114. Rail Power Cable Group

Two rail power cable assemblies (fig. 224), in their stowed position, are attached to the connector shells on the front left outrigger (fig. 218). They extend into the launching-handling rail through the conduit outlet covers (fig. 224) and forward to the terminal board group (fig. 218). Typical replacement procedures for either cable assembly are outlined in a through d below.

a. Removal.

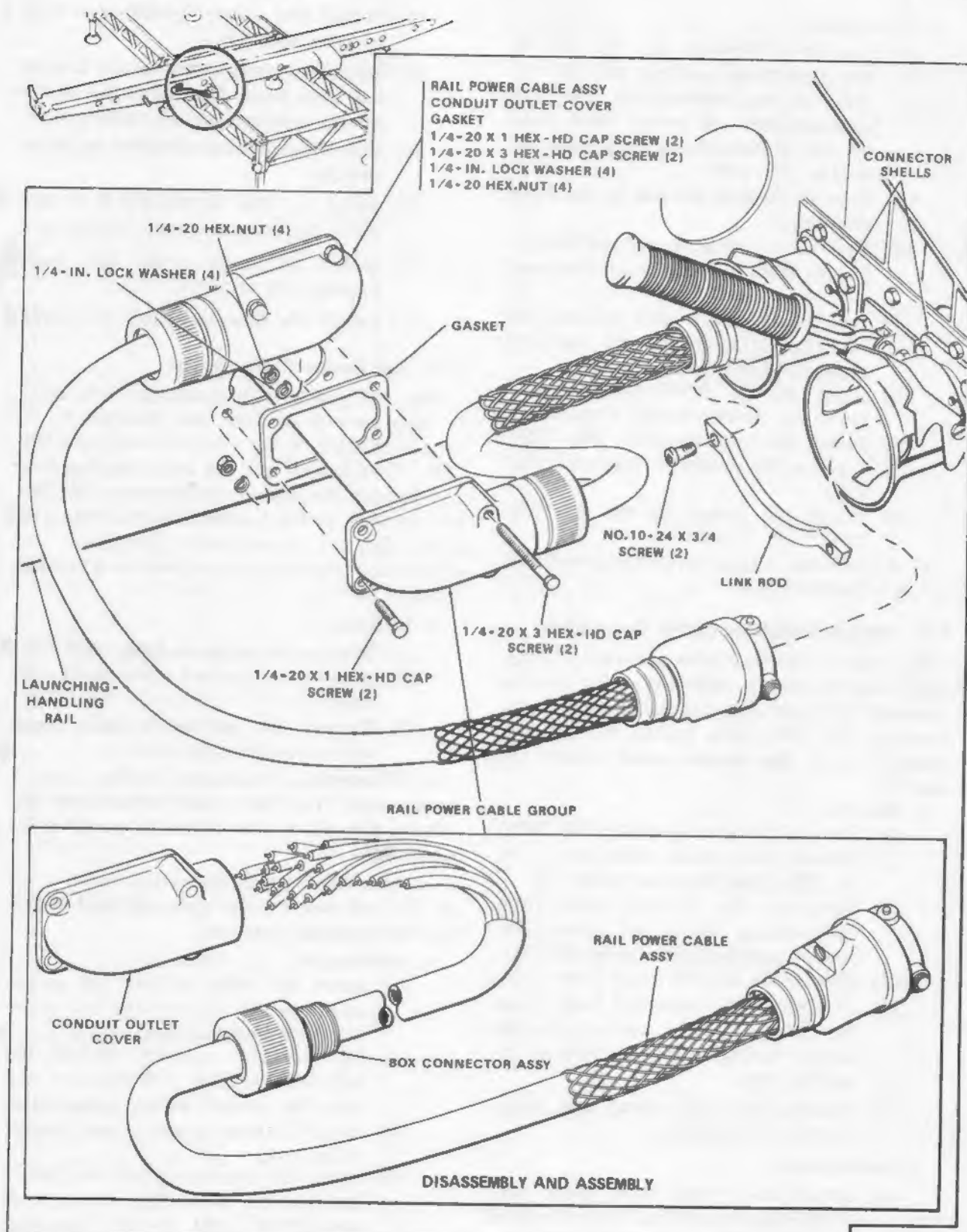
- (1) Remove the cover assembly (fig. 219).
- (2) Remove the conduit outlet cover (fig. 224).
- (3) Remove the rail power cable group and connecting link rod.

b. Disassembly. Disconnect the box connector assembly from the conduit outlet cover and remove the outlet from the rail power cable assembly.

c. Assembly. Install the conduit outlet cover on the rail power cable assembly and attach the box connector assembly.

d. Installation.

- (1) Insert the wires of the rail power cable assembly through the hole in the launching-handling rail.
- (2) Pull the cable assembly through the rail; refer to TM 9-1440-250-35/1, and make the proper wiring connections.
- (3) Install the cable assembly and conduit outlet cover.
- (4) Install the connecting link rod, insuring that the mounting screws have screwdriver slots in the threaded ends.



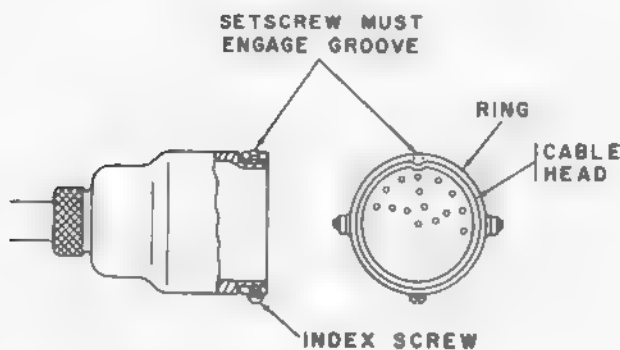
MI 37925

Figure 224. Rail power cable group — removal and installation.

- (5) Install the cover assembly (fig. 219).

e. Adjustment of the Quick-disconnect Adapter Ring. Adjust the quick-disconnect adapter ring to obtain a snug fit when the rail power cable assembly is locked in position, as outlined in steps (1) and (2) below.

- (1) Remove the setscrew and index screw (fig. 224.01) and adjust the ring until a snug fit is secured.
- (2) Aline the threaded hole nearest the indexing groove in the cable head with the indexing groove and install the setscrew to lock the ring. Install the indexing screw in the remaining threaded hole.



ORD 6337597

Figure 224.01. Adjustment of the quick-disconnect adapter ring.

114.1. Guidance Set Cooling System Cable Assembly and Blower Relay

The guidance set cooling system cable assembly (8, fig. 224.1) and blower relay (12) are located inside the launching-handling rail (13). The cable assembly extends from the blower assembly (9D, fig. 244.1) to the terminal board group (fig. 225). The cable assembly of the blower relay extends to the terminal board group.

a. Removal of the Guidance Set Cooling System Cable Assembly.

- (1) Remove the cover assembly (fig. 219) and cover (3, fig. 244.1).

- (2) Remove the hexagon nuts (4) and lockwashers (5).
- (3) Raise the blower assembly and mount group (9) and disconnect the guidance set cooling system cable assembly (6); loosen the retaining bands (7).
- (4) Remove the blower assembly and mount group.
- (5) Disconnect the cable assembly (8, fig. 224.1) from the terminal board group (fig. 225).
- (6) Remove the loop clamp (4, fig. 224.1).
- (7) Remove the hexagon nuts (5), flat washer (6), and pan-head screws (7).
- (8) Remove the cable assembly.

b. Installation of the Guidance Set Cooling System Cable Assembly.

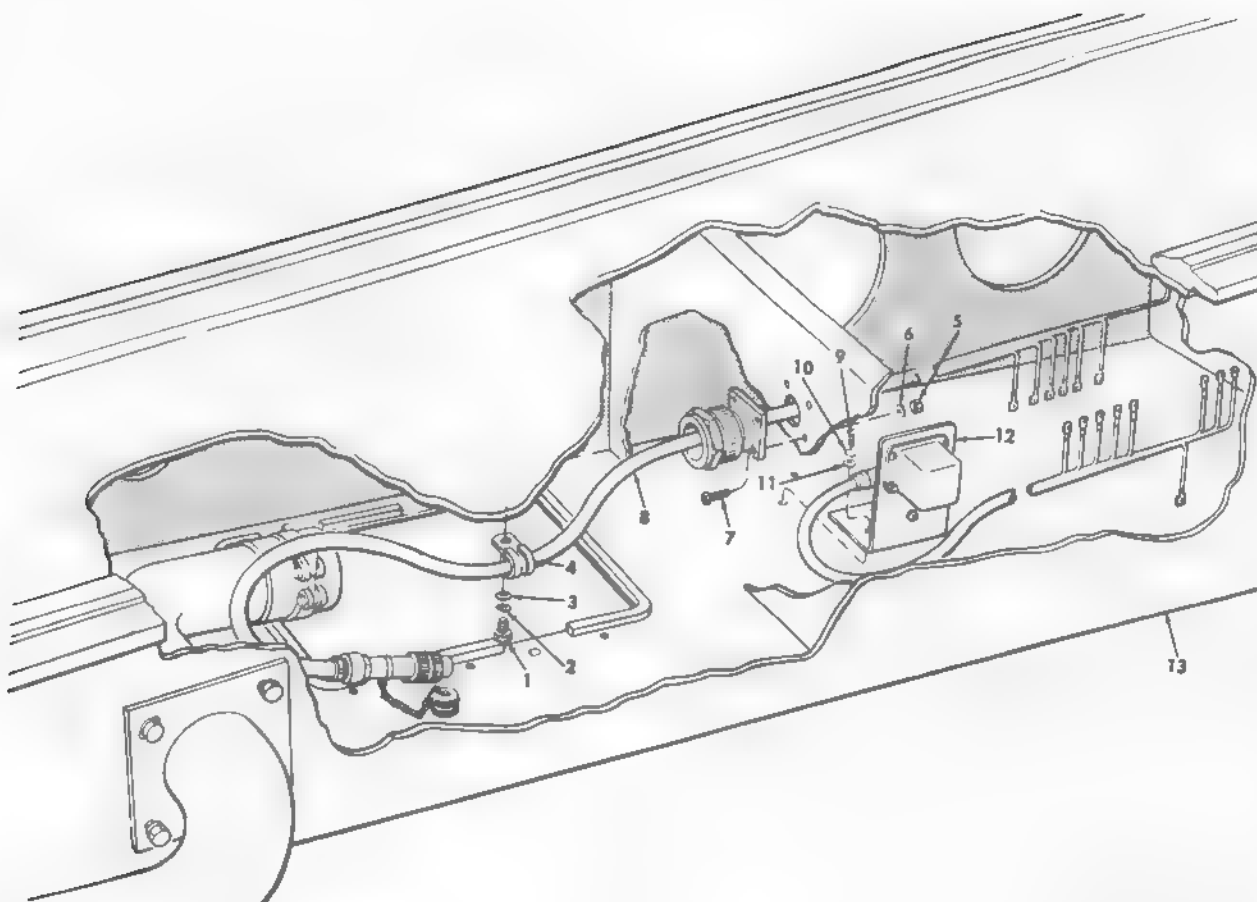
- (1) Position the cable assembly (8, fig. 224.1) in the launching-handling rail (13).
- (2) Install the pan-head screws (7), flat washers (6), and hexagon nuts (5).
- (3) Install the loop clamp (4).
- (4) Refer to TM 9-1440-250-35/1 and connect one end of the cable assembly to the terminal board group (fig. 225).
- (5) Position the blower assembly and mount group (9, fig. 244.1) in the launching-handling rail (10).
- (6) Raise the blower assembly and mount group and connect the cable assembly (6); install the hose (8) and tighten the retaining bands (7).
- (7) Secure the blower assembly and mount group.
- (8) Install the cover assembly (fig. 219) and cover (3, fig. 244.1).

Note. The key numbers shown in parentheses in c and d below refer to figure 224.1.

c. Removal of the Blower Relay.

- (1) Remove the cover assembly (fig. 219).
- (2) Disconnect the cable assembly of the blower relay (12) from the terminal board group (fig. 225).
- (3) Remove the blower relay.

d. Installation of the Blower Relay.



ORD G61493

- 1—No. 10-32 x 0.464 hex-hd shear bolt
- 2—No. 10 lockwasher
- 3—No. 10 fl washer
- 4—Loop clamp
- 5—No. 10-32 self-locking hex nut
- 6—No. 10 fl washer (4)
- 7—No. 10-32 x 7/8 pan-hd screw (4)

- 8—Guidance set cooling system cable assembly
- 9—No. 10-32 x 1/2 truss-hd screw (3)
- 10—No. 10 lockwasher (3)
- 11—No. 10 fl washer (3)
- 12—Blower relay
- 13—Launching-handling rail

Figure 224.1. Guidance set cooling system cable assembly and blower relay—removal and installation.

- (1) Position blower relay (12) in launching-handling rail (13).
- (2) Secure blower relay (12).
- (3) Refer to TM 9-1440-250-35/1 and connect cable assembly of blower relay (12) to terminal board group (fig. 225).

115. Terminal Board Group

There are two terminal board groups (fig. 225) located inside the launching-handling rail. Each terminal board group consists of a bracket and five terminal board assemblies with bus bars.

a. Removal.

- (1) Remove cover assembly (fig. 219).
- (2) Remove wires of cable assemblies attached to terminal board group (fig. 225), as described in paragraph 38d.

Note. Removal of any terminal board assembly requires removal of terminal board group.

- (3) Remove terminal board group.

b. *Disassembly.* Disassemble terminal board group.

c. *Assembly.* Assemble terminal board group.

d. Installation.

- (1) Install terminal board group.
- (2) Refer to TM 9-1440-250-35/1 and make proper wiring connections.
- (3) Install cover assembly (fig. 219).

116. Channel, Connector Assembly, Electrical Connector Shell and Dummy Connector

The channel (fig. 223) is located on the outside of the launching-handling rail near the outrigger (fig. 219) at the rear. The connector assembly (fig. 223) is located inside the rail.

a. Channel.

- (1) Remove channel.
- (2) Install channel.

*b. Connector Assembly.**(1) Removal.*

- (a) Remove cover assembly (fig. 219).
- (b) Loosen packing nut (fig. 223) of the connector assembly and pull cable assembly to the rear through bulkhead and connector assembly.

*(c) Remove connector assembly.**(2) Installation.*

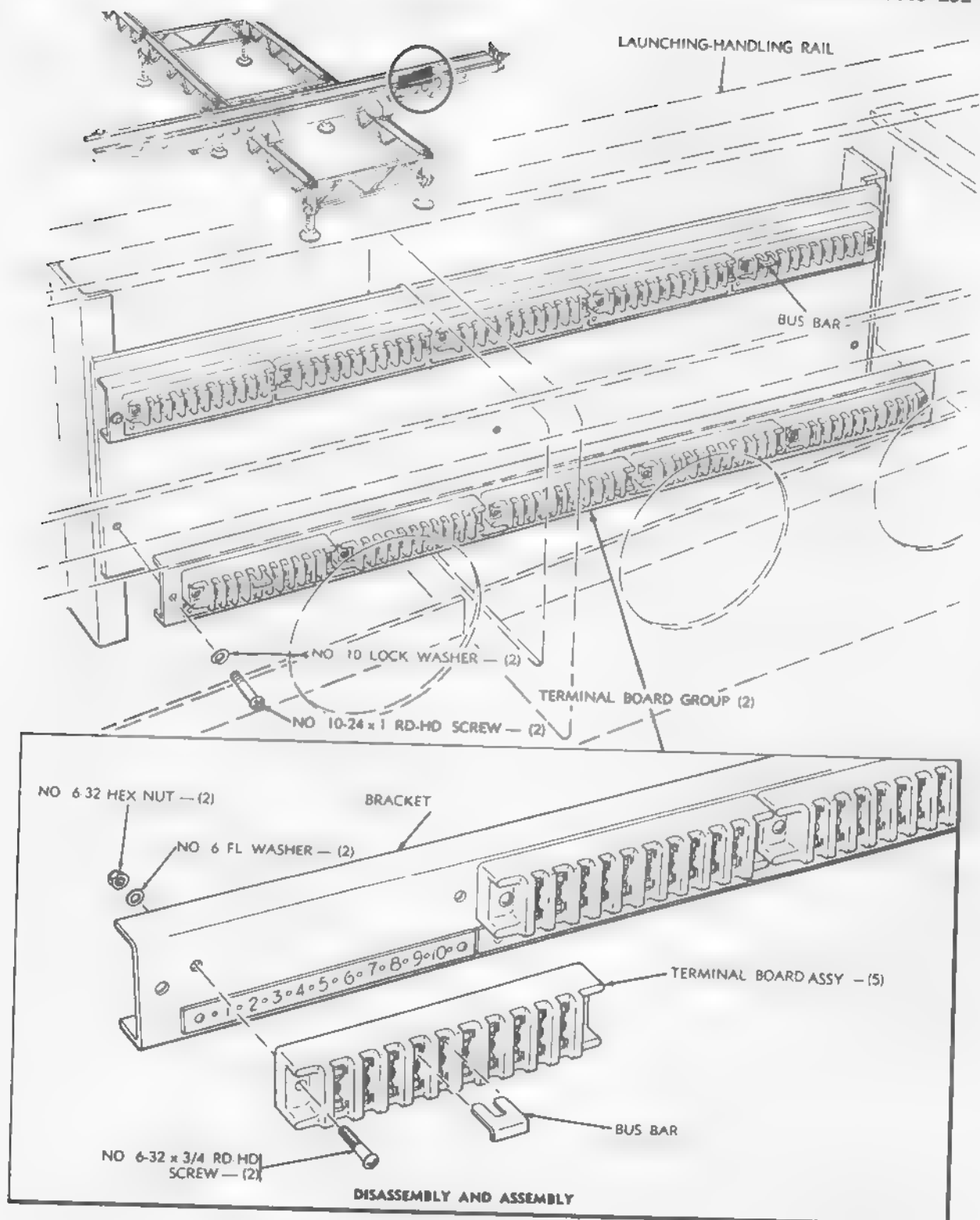
- (a) Position connector assembly in hole in bulkhead.
- (b) Loosen packing nut and insert wires of missile-away cable assembly.
- (c) Pull cable assembly through connector assembly and bulkhead.
- (d) Refer to TM 9-1440-250-35/1 and make proper wiring connections.
- (e) Tighten packing nut.
- (f) Install cover assembly (fig. 219).

c. Electrical Connector Shell and Dummy Connector.

Note. The key letters shown in parentheses in (1) and (2) below refer to figure 223.1.

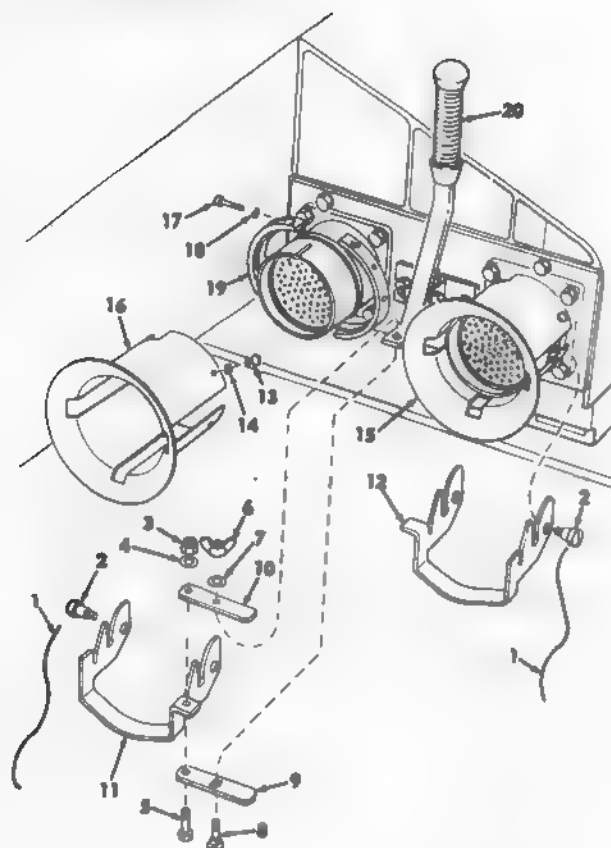
(1) Removal.

- (a) Remove electrical connector cover (1) from shell (15) and cover (16) from dummy connector (19).



RA PD 464004A

Figure 225. Terminal board group—removal and installation—typical.



ORD G61219

- 1—0.032-inch lockwire
- 2—Shoulder screw
- 3—No. 10-32 hexagon nut
- 4—0.2 03-inch-id flat washer
- 5—No. 10-32 x 29/32 hexagon-head bolt
- 6—No. 10-24 wing nut
- 7—0.203-inch-id flat washer
- 8—Square neck bolt
- 9—Plate
- 10—Follower plate
- 11—Cam 03492-R202
- 12—Cam 03492-R201
- 13—No. 10-32 x 3/8 round head screw
- 14—No. 10 lockwasher
- 15—Bell assembly
- 16—Bell assembly

Figure 226. Removal and installation of the bell assemblies.

- 17—No. 10-32 x 1 socket-head capscrew
- 18—No. 10 lockwasher
- 19—Clamp
- 20—Disconnect lever

Figure 226. Removal and installation of the bell assemblies—legend—continued.

- (b) Remove shell (15) and dummy connector (19).

(2) Installation.

- (a) Install shell (15) and dummy connector (19).
- (b) Install cover (16) and electrical connector cover (1).

117. Bell Assemblies

Note. The key numbers shown in parentheses in a and b below refer to figure 226 unless otherwise indicated.

Two bell assemblies (15 and 16) are located on the launching-handling rail (fig. 218).

a. Removal.

- (1) Disconnect rail power cable assemblies (fig. 224).
- (2) Remove shoulder screws (2).
- (3) Remove plate (9), follower plate (10), and cams (11 and 12).
- (4) Loosen socket-head cap screw (17) and remove bell assemblies.
- (5) Remove clamps (19).

b. Installation.

- (1) Install clamps (19).

Note. When installing clamps, make certain connections are made to the vertical, that is, with top at twelve o'clock and bottom at six o'clock.

- (2) Position bell assemblies (15 and 16) and install and tighten socket-head cap screw (17).
- (3) Install cams (11 and 12) with shoulder screws (2).
- (4) Install follower plate (10) and plate (9).
- (5) Connect rail power cable assemblies (fig. 224).

Section IV. MAINTENANCE OF LAUNCHING-HANDLING BREAKAWAY INSTALLATION

118. General

This section describes maintenance of the components of the launching-handling rail breakaway installation (fig. 218). The breakaway installation consists of a pivot group

(fig. 227) and a bracket group (fig. 229). The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

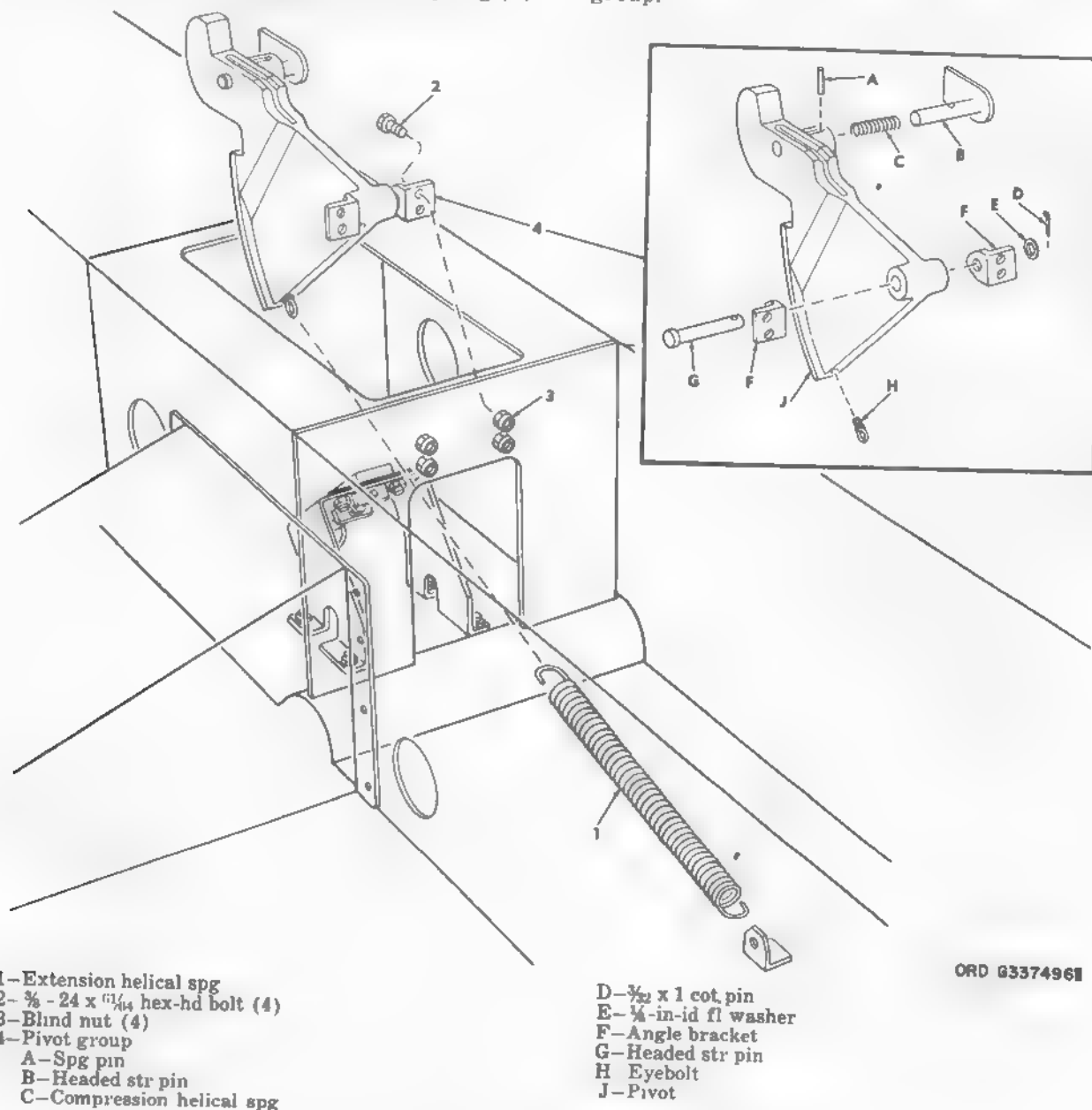
Figure 228. (Deleted)

119. Pivot Group*a. Removal.*

- (1) Remove the spring (1, fig. 227).
- (2) Remove the pivot group (4).

b. Disassembly. Disassemble the pivot group (4).*c. Assembly.* Assemble the pivot group (4).*d. Installation.*

- (1) Install the pivot group (4).
- (2) Install the extension helical spring (1).

120. Bracket Group*a. Removal* (fig. 229). Remove the bracket group.*b. Disassembly* (fig. 230). Disassemble the bracket group.*c. Assembly* (fig. 230). Assemble the bracket group.*d. Installation* (fig. 229). Install the bracket group.

ORD 63374961

Figure 227. Removal and installation of the pivot group.

Section V. MAINTENANCE OF DECELERATOR SYSTEM COMPONENTS

121. General

This section describes the maintenance of the front and rear decelerators, (figs. 231 and 232), the hydraulic network, and the cork gasket for the hydraulic reservoir. The general precautions described in paragraphs 58 and 105 must be observed when performing any maintenance on these items. Refer to paragraph 37a for hydraulic fluid specifications.

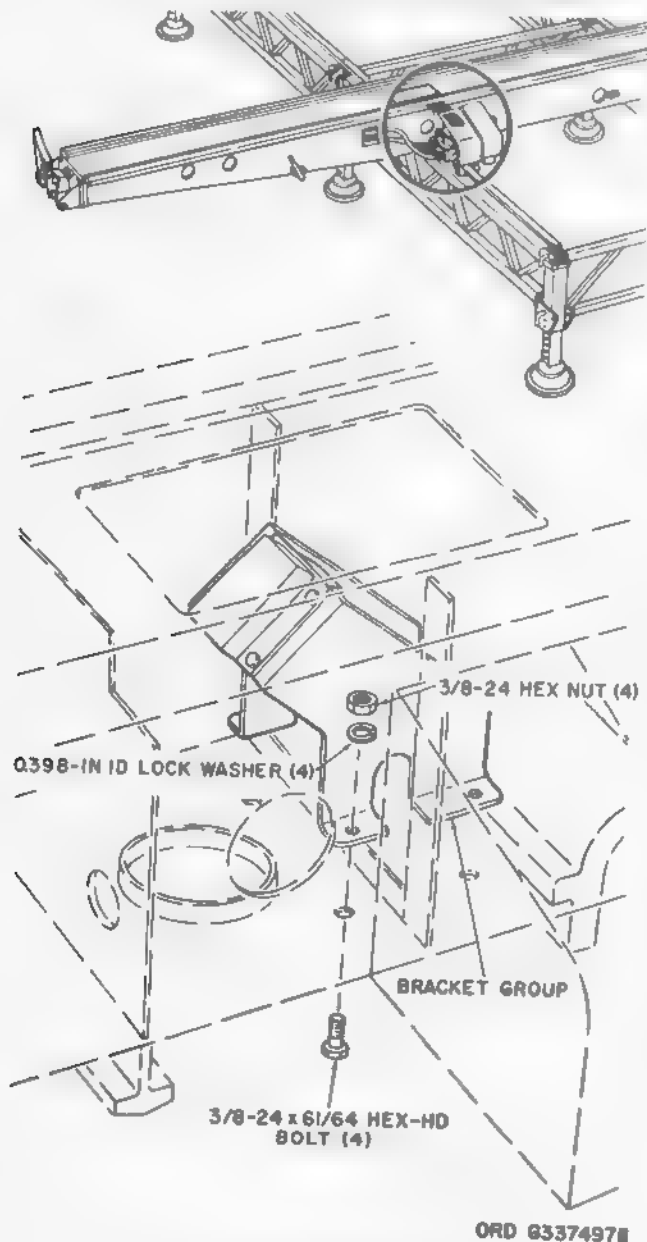


Figure 229. Removal and installation of the bracket group.

122. Decelerator

A decelerator (fig 218), covered by an individual guard, is located at each of the four outriggers. The procedures in *a* through *c* below are typical for both the front decelerator (fig 231) and rear decelerator (fig. 232).

a. Removal.

- (1) Remove the two front guard assemblies (fig. 219).
- (2) Provide a suitable container to catch hydraulic fluid from the reservoir (figs. 231 and 232); disconnect the tube assembly 8525234 from the decelerator, and drain the hydraulic fluid.
- (3) Remove the decelerator and cap the open line.

b. Partial Disassembly (fig. 233).

- (1) Remove the pin and plug.
- (2) Remove the bushing group, retainer, and preformed packing.

Warning: When removing the head in the following step, use care to avoid bodily injury resulting from the spring-loaded piston and spring group.

- (3) Remove the head.
- (4) Disassemble the remaining parts of the decelerator.

c. Assembly (fig. 233).

- (1) Assemble the decelerator.
- (2) Torque the hexagon nut of the elbow to 300 pound-inches.

d. Inspection and Test. Test the decelerator as outlined in steps (1) and (2) below using hydraulic test stand 8523711 (fig. 234) filled with hydraulic fluid.

(1) Pretest.

- (a) Perform a visual inspection of the decelerator for completeness of assembly, and for nicks, scratches, or other damage.

- (b) Prior to testing the decelerator, warm up the test stand as prescribed in TM 9-4935-254-15.

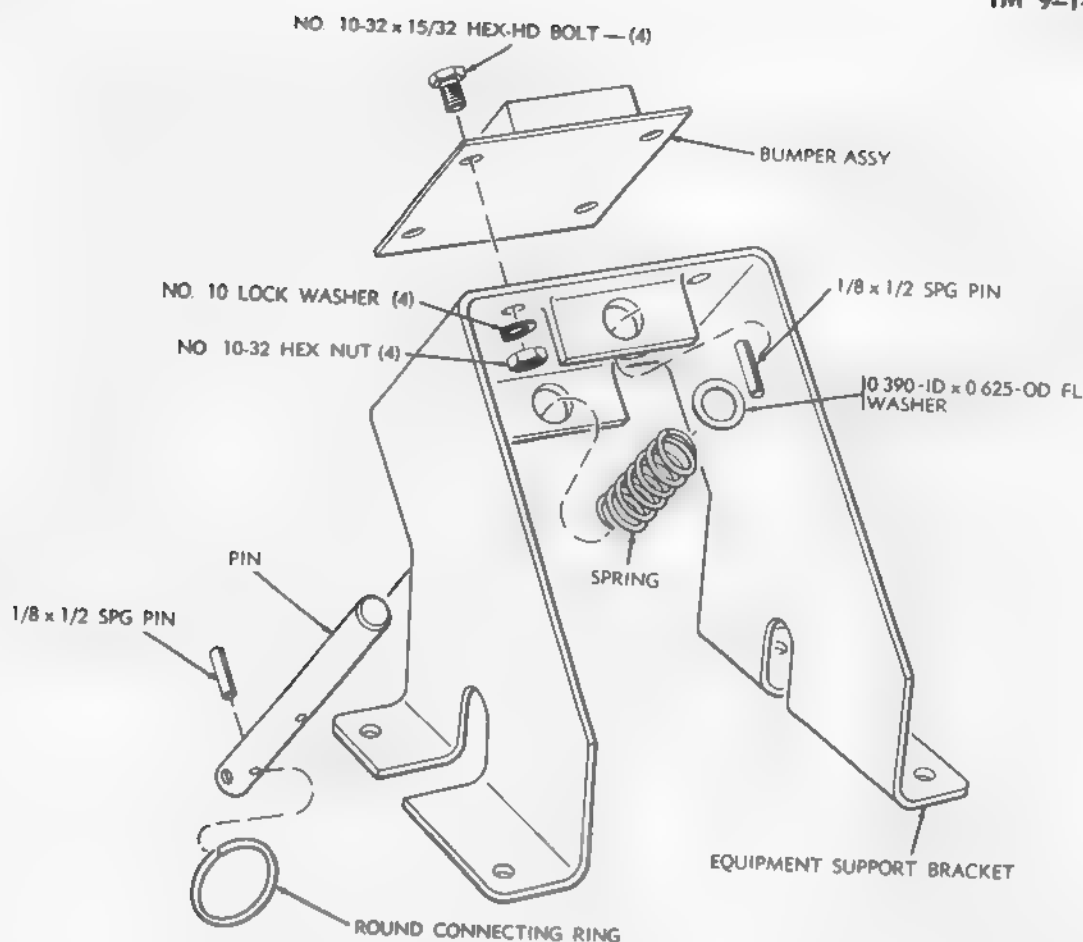


Figure 230. Bracket group—disassembly and assembly.

RA PD 463121A

(2) *Acceptance test (fig. 234).*

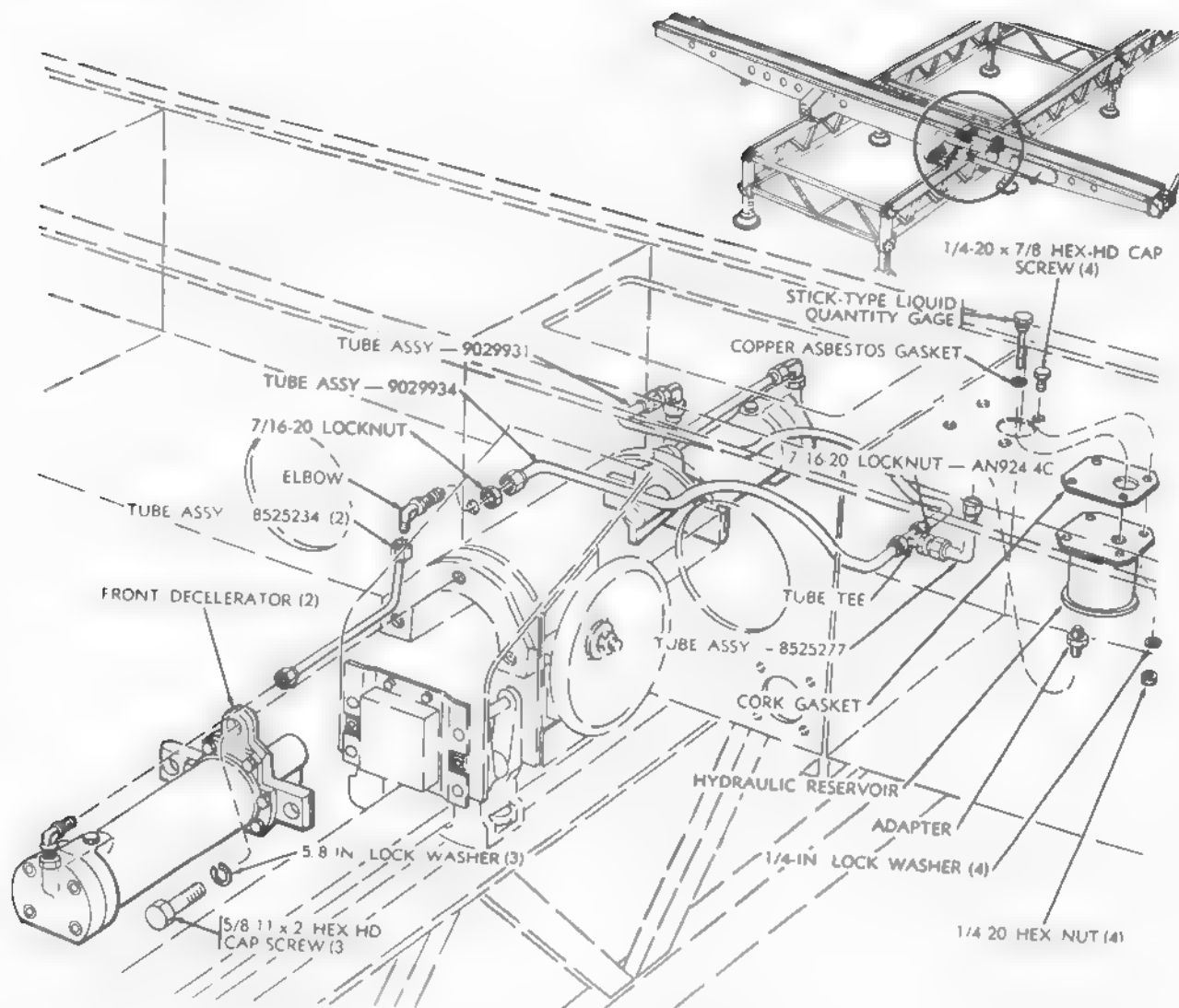
- (a) Connect test hose assembly, test hose assembly reducer, two adapters, two bleed valve hose assemblies, bleed valve, reducer, and quick-disconnect coupling half; torque fittings to 300 pound-inches.
- (b) Attach coupling half to **PRESSURE** of the **MOTOR PUMP SYSTEM** on the panel of the test stand; connect the test hose assembly to the elbow on decelerator and torque coupling nut to 300 pound-inches.
- (c) Position test stand controls and perform acceptance test as prescribed in table XIII.

- (d) Disconnect coupling half, reducer, bleed valve hose assembly, adapters, bleed valve, test hose assembly reducer, and test hose assembly; stow in cabinet of test stand.

- (e) Position the decelerator, elbow down, so that all hydraulic fluid will drain into the sink. Cap elbow to prevent contamination.

e. Installation.

- (1) Install decelerator (figs. 231 or 232).
- (2) Remove protective cap from elbow of decelerator, connect tube assembly, and torque coupling nut to 150 pound-inches.

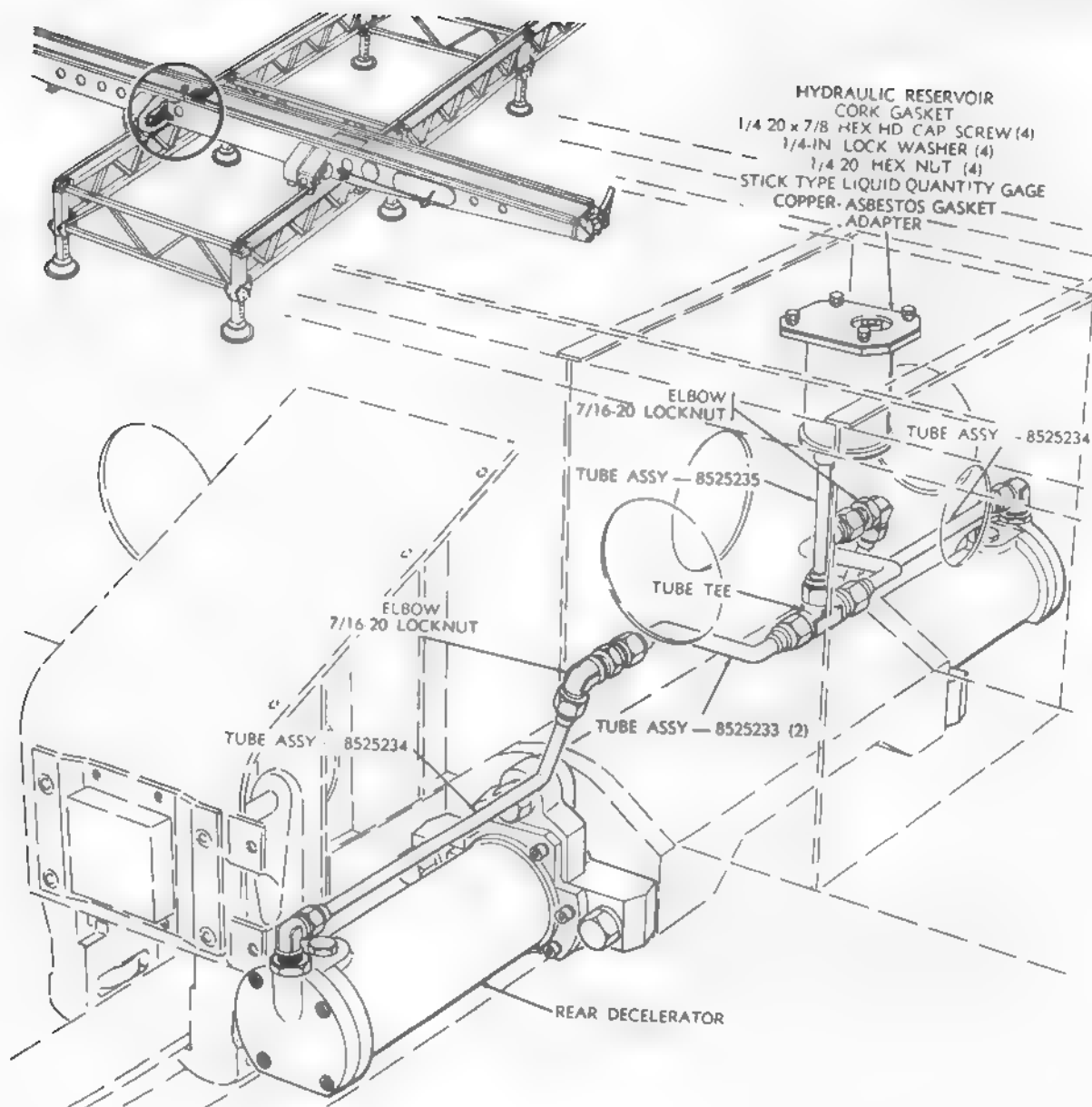


ORD G55663A

Figure 231. Decelerator and hydraulic network—removal and installation.

Table XIII. Decelerator Acceptance Test Using Hydraulic Test Stand 8523711

Control	Position	Reading/Indication
a. GAGE A SHUTOFF	Close	
b. GAGE B SHUTOFF	Open	
c. PRESSURE TO MANIFOLD—MANIFOLD TO RESERVOIR	PRESSURE TO MANIFOLD	
d. RELIEF VALVE	Open	
e. PUMP MOTOR	Depress START pushbutton	Note The piston rod of the decelerator is spring-loaded in retracted position. As hydraulic pressure is applied, it extends. When pressure is released, the spring returns the rod to the retracted position. During movement of piston rod, check closely to make sure that it operates smoothly and freely.



RA PD 463945A

Figure 232. Decelerator and hydraulic network—removal and installation—continued.

Table XIII. Decelerator Acceptance Test Using Hydraulic Test Stand 8529711—Continued.

Control	Position	Reading/Indication
f. RELIEF VALVE	Adjust slowly	To read 2000 (± 25) psi on GAGE B. Maintain 2000 (± 25) psi for 60 seconds. No leakage permitted at bleed plug. If leakage occurs, disassemble decelerator as described in b above. Replace defective components, assemble, inspect, and retest as described in c and d above.

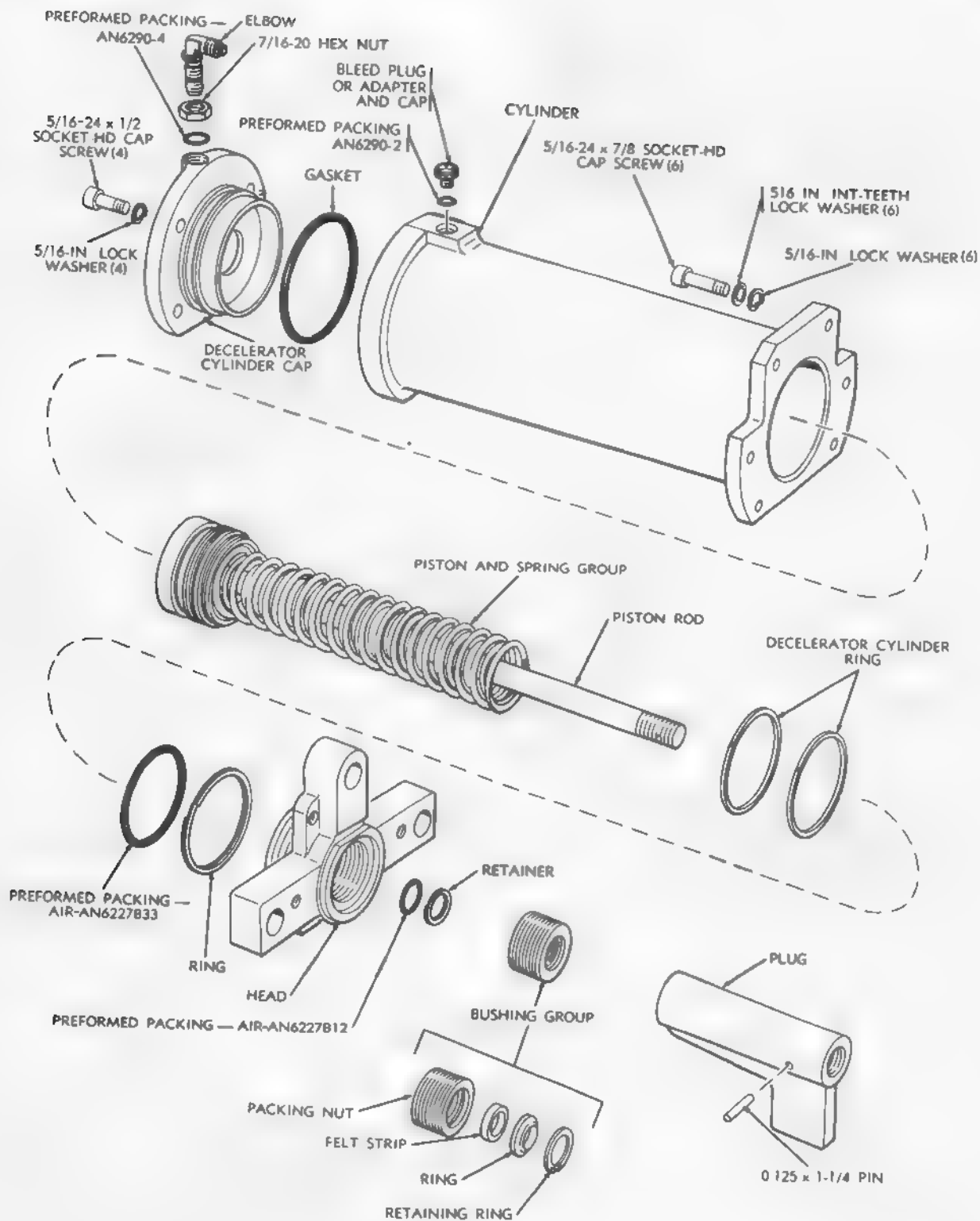


Figure 233. Decelerator—partial disassembly and assembly.

RA PD 463185A

Table XIII. Decelerator Acceptance Test Using Hydraulic Test Stand 8523711 — Continued

Control	Position	Reading/Indication
g. RELIEF VALVE	Open	
h. PRESSURE TO MANIFOLD — MANIFOLD TO RESERVOIR	MANIFOLD TO RESERVOIR	
i. PUMP MOTOR	Depress STOP pushbutton	
j. GAGE B SHUTOFF	Close	
k. Open bleed valve 8169439 and allow fluid in hose to drain into sink.		

(3) Fill the hydraulic reservoir with hydraulic fluid as described in TM 9-1440-250-20/1.

(4) Perform the bleed procedure for the decelerator as described in TM 9-1440-250-20/1.

(5) Install the guard assembly (fig. 219).

(2) Install the tube assemblies and torque the coupling nuts to the following values.

Tube assembly	Torque value (pound-inches)
8167121	25
8525234	50
8525277	50
9029931	150
9029934	150

(3) Install the cover assembly (fig. 219).

(4) Fill the hydraulic reservoir (figs. 231 and 232) with hydraulic fluid, as described in TM 9-1440-250-20/1.

(5) Perform the bleed procedure for the decelerator as described in TM 9-1440-250-20/1.

(6) Install the guard assembly (fig. 219).

123. Decelerator Hydraulic Network

Hydraulic networks are provided for both the front and rear decelerators (figs. 231 and 232). These networks consist of the necessary tube assemblies and the fittings to provide a gravity source of the hydraulic fluid from the hydraulic reservoir to their respective decelerators. The decelerator hydraulic network is independent of the launcher hydraulic systems.

a. Removal.

(1) Remove the front or rear guard assembly (fig. 219) from the decelerator hydraulic network to be replaced.

(2) Remove the cover assembly to provide easier access to the front decelerator network.

(3) Provide a suitable container to catch the hydraulic fluid from the reservoir (figs. 231 and 232); disconnect tube assembly 8525234, and drain the hydraulic fluid.

(4) Remove parts of the network requiring replacement and cap all open lines.

b. Installation.

(1) Install the adapter, the tube tee, and the elbow.

124. Cork Gasket

A cork gasket (figs. 231 and 232) is located between the top of each hydraulic reservoir and the inside top of the launching-handling rail. Typical removal and installation procedures are described in *a* and *b* below.

a. Removal.

(1) Remove the guard assembly (fig. 219).

(2) Disconnect the tube assembly (figs. 231 or 232) from the front or rear decelerator and drain the hydraulic fluid. Cap all open lines.

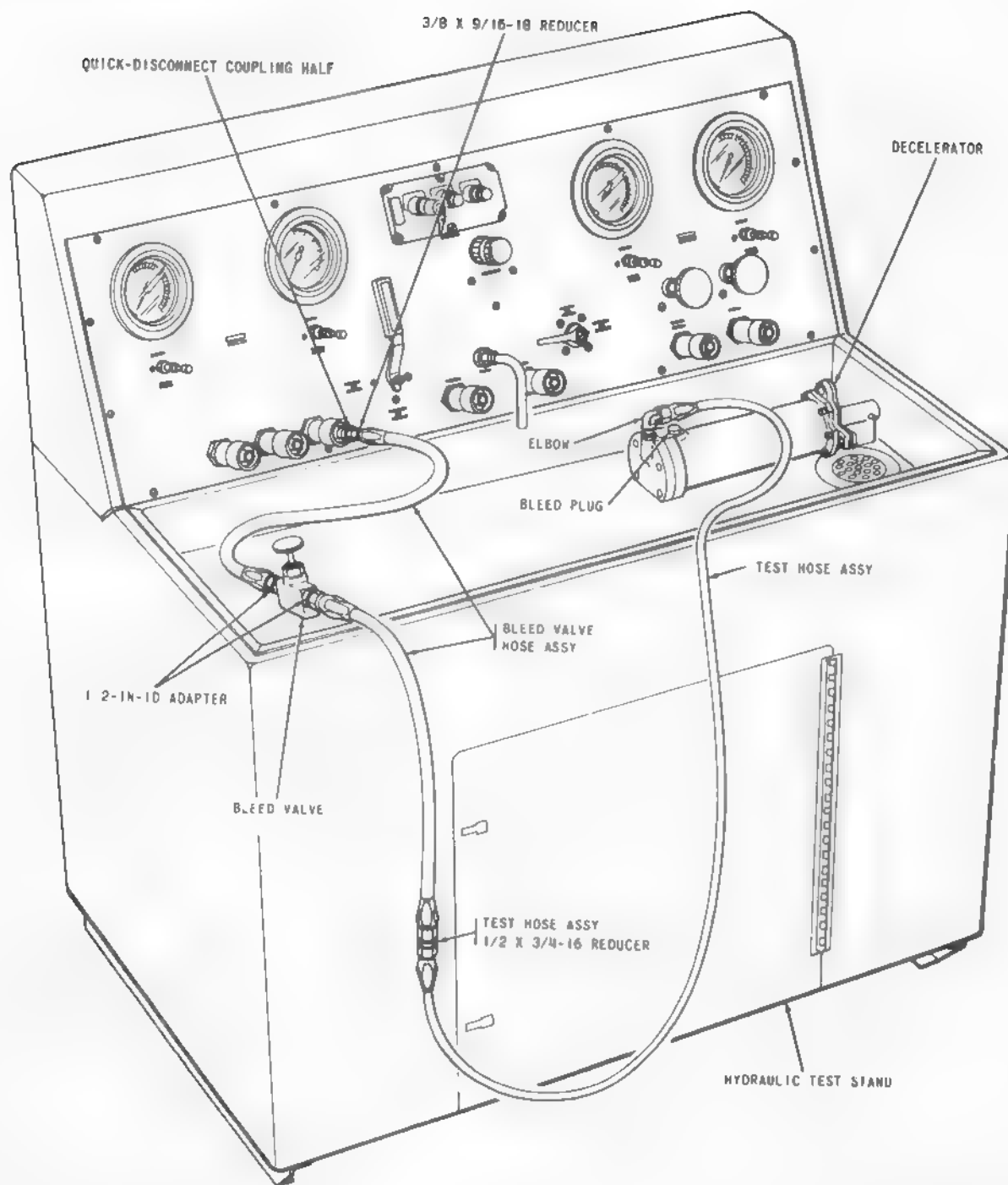
(3) Remove the tube assembly from the hydraulic reservoir.

(4) Remove the reservoir and gasket.

b. Installation.

(1) Position the gasket over the mounting holes of the hydraulic reservoir.

(2) Install the reservoir.



RA PD 463122A

Figure 234. Decelerator — acceptance test.

- (3) Install the tube assembly between the reservoir and the tube tee. Torque the coupling nut to 50 pound-inches.
- (4) Connect the tube assembly to the decelerator, torque the coupling nut to 50 pound-inches.
- (5) Fill the reservoir with hydraulic fluid as described in TM 9 1440-250-20/1.
- (6) Perform the bleed procedures for the decelerator as described in TM 9-1440-250-20/1.
- (7) Install the guard assembly (fig. 219).

Section VI. MAINTENANCE OF LAUNCHING-HANDLING RAIL BRAKE

125. General.

This section describes maintenance of the brake operating mechanism and the brake components. The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

126. Brake Operating Mechanism

The linkage of the brake operating mechanism (figs. 235, 236, and 237) extends from the positioning handle (fig. 235) to the brake tube assembly (fig. 236) near the front decelerators (fig. 231), and to the stop and positioning tube assembly (fig. 237) near the rear decelerators (fig. 232).

a. Removal.

- (1) Remove cover assembly (fig. 219) and plate.
- (2) Remove extension spring (fig. 236) and spring (fig. 237).
- (3) Remove square-head setscrews and hexagon nuts from stops (fig. 235).
- (4) Remove positioning handle connector assembly (fig. 235) and rail arm connector assembly (figs. 235 and 236).
- (5) Remove positioning handle (fig. 235) and hand crank.
- (6) Remove rigid shaft.
- (7) Remove lubrication fittings from pillow block plain bearing units.
- (8) Remove two plain bearing units.
- (9) Remove connector hand crank and missile launching rail arm.
- (10) Remove sleeve bearing.
- (11) Remove brake connector assembly (figs. 236 and 237).
- (12) Remove lever assembly (fig. 237).
- (13) Remove lubrication fitting from bearing.
- (14) Remove bearing.

b. Installation.

- (1) Install bearing.

- (2) Install lubrication fitting on bearing.
- (3) Install lever assembly.
- (4) Install brake connector assembly (figs. 236 and 237).
- (5) Install sleeve bearing (fig. 235).
- (6) Install lubrication fitting on sleeve bearing.
- (7) Install connector hand crank and missile launching rail arm.
- (8) Install two pillow block plain bearing units.
- (9) Install lubrication fittings on bearing units.
- (10) Install rigid shaft.
- (11) Install positioning handle and hand crank.
- (12) Install positioning handle connector assembly (fig. 235) and rail arm connector assembly (figs. 235 and 236).
- (13) Install $\frac{1}{2}$ -13 x $\frac{1}{4}$ square-head setscrews (fig. 235) on stops.
- (14) Install extension spring (fig. 236) and spring (fig. 237).
- (15) Install cover assembly (fig. 219) and plate.

c. Adjustment.

- (1) Depress hand crank (fig. 235) or positioning handle until brake tube assembly (fig. 236) and stop and positioning tube assembly (fig. 237) are released and movement of the launching-handling rail is possible. Adjust square-head setscrew (fig. 235) at the rear to allow holding the handle at RELEASE, and tighten the hexagon nut of the square-head setscrew.
- (2) Raise crank until brake tube assembly and positioning tube assembly are locked on stops; adjust setscrew at the front while holding crank in place, and tighten the nut of the setscrew.

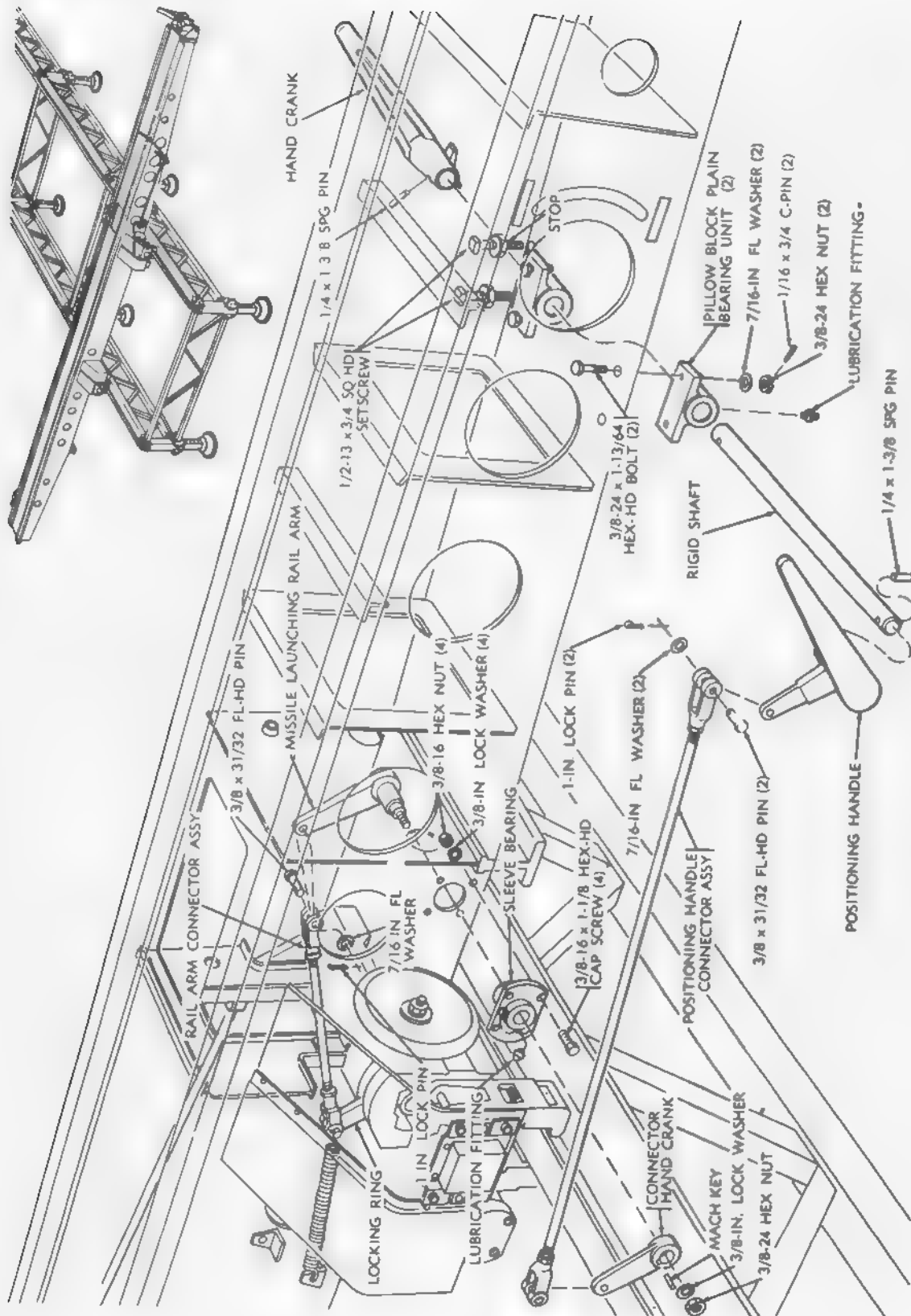


Figure 285. Brake-operation mechanism—removal and installation.

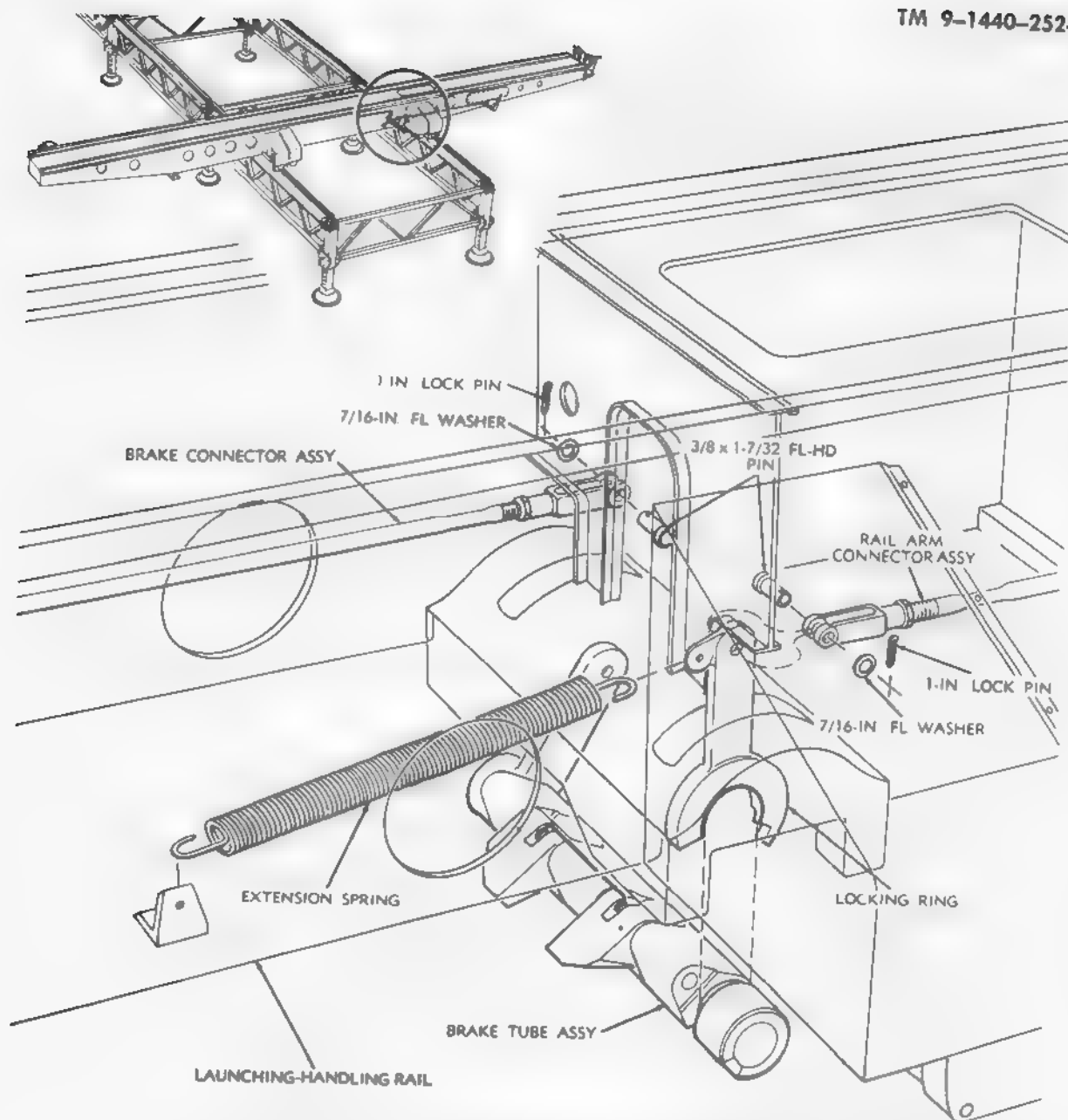


Figure 236. Brake-operating mechanism—removal and installation—continued.

RA PD 464185A

127. Brake Tube Assembly

The brake tube assembly (fig 236) is located underneath the launching-handling rail at the front.

a. Removal.

- (1) Position launching-handling rail against loading rack stops (fig. 56).
- (2) Remove two front guard assemblies (fig. 219).

- (3) Remove both front decelerators (fig. 231) as described in paragraph 122a.

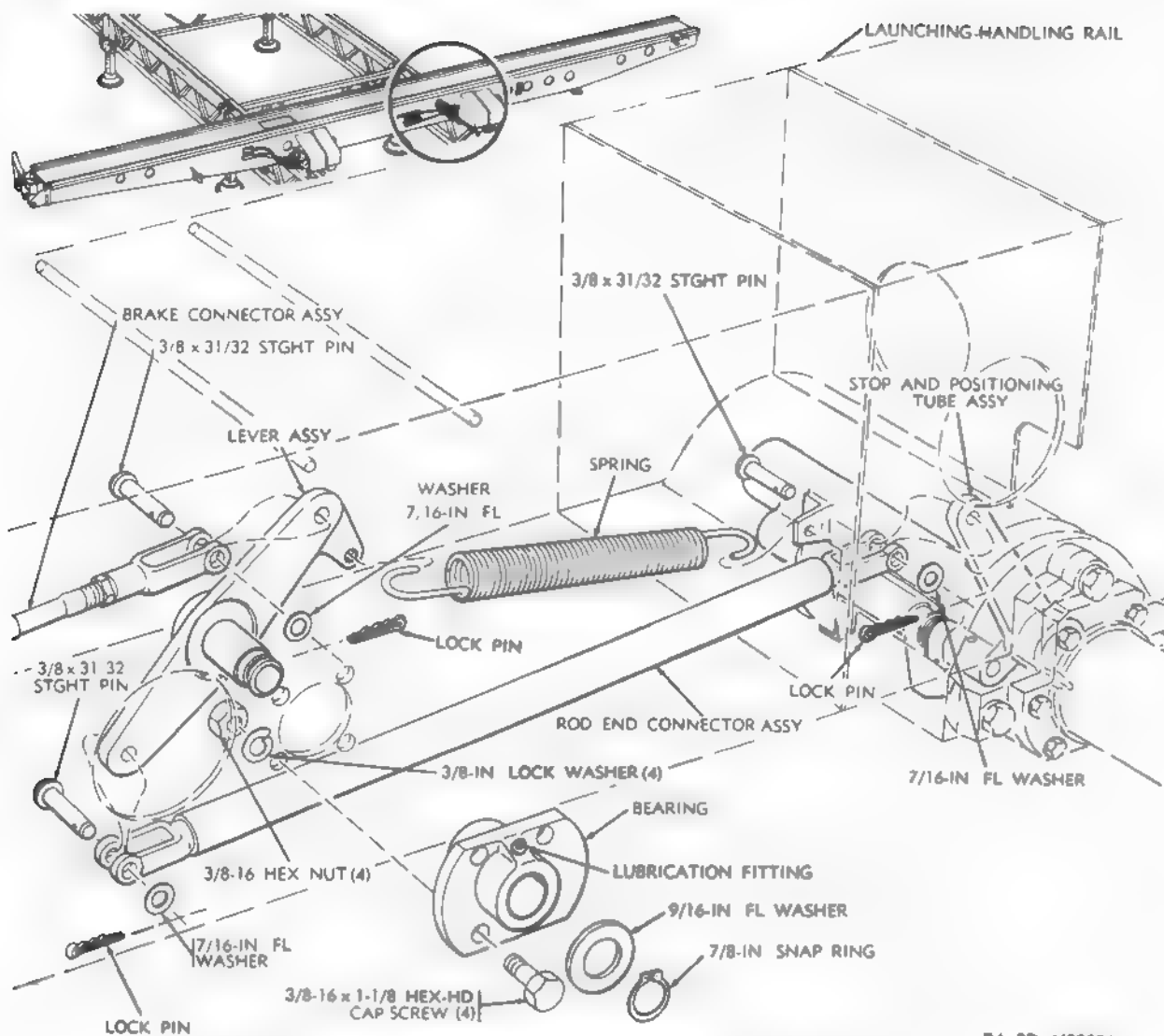
- (4) Remove brake tube assembly and locking ring (fig. 236).

b. Disassembly (fig. 238). Disassemble brake tube assembly.

c. Assembly.

- (1) Assemble brake tube assembly.

Note. Spring — 8530890 must be installed with control cam — 8530897 and spring — 8530904 with control cam — 8530898.



RA PD 463989A

Figure 237. Brake-operating mechanism—removal and installation—continued.

- (2) Check cams for freedom from binding.
- d. Installation.
- (1) Position brake tube assembly (fig. 236) in launching-handling rail and attach locking ring.
 - (2) Install locking ring.
 - (3) Install front decelerators (fig. 231) as described in paragraph 122e.
 - (4) Install two front guard assemblies (fig. 219).

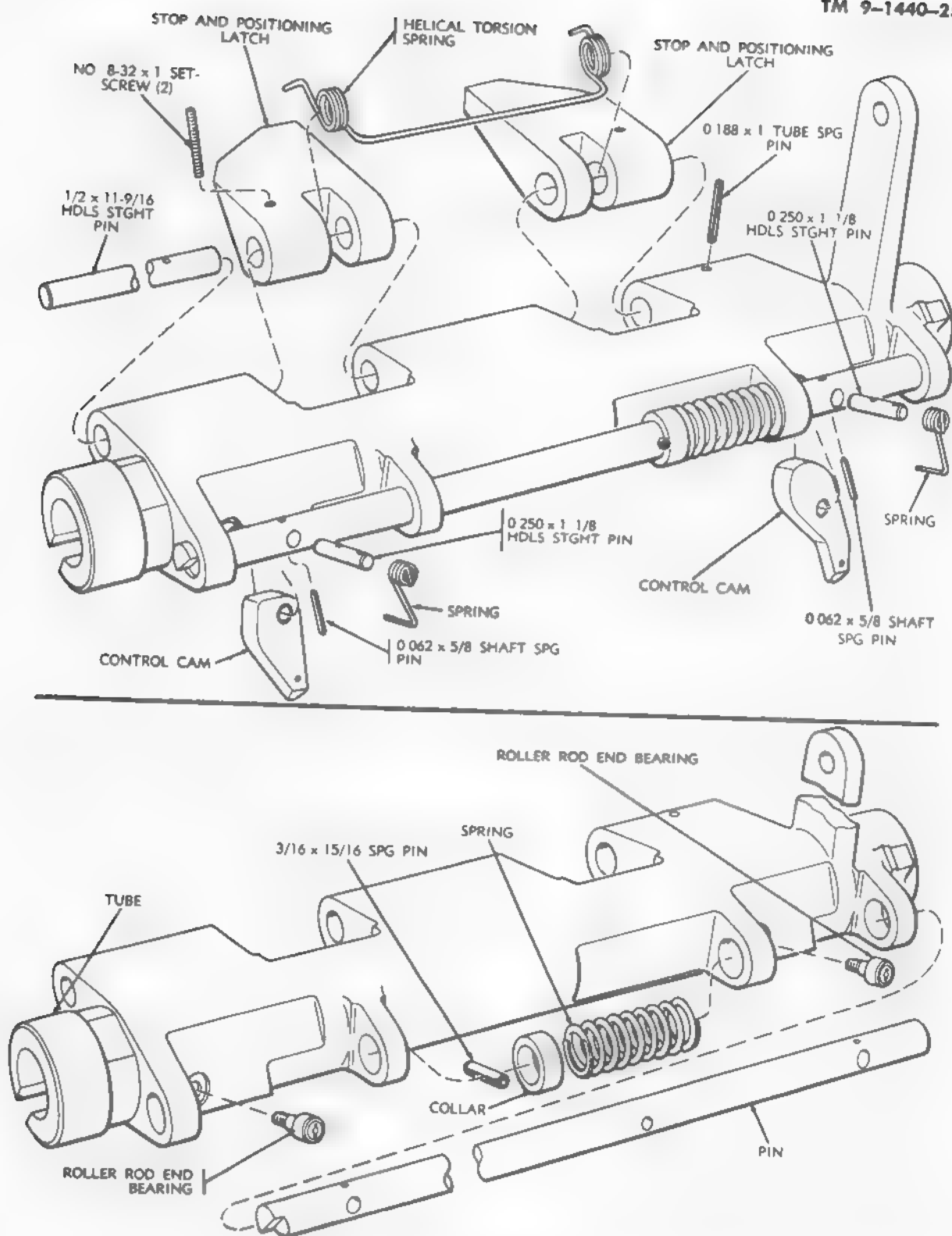


Figure 238. Brake tube assembly—disassembly and assembly.

RA PD 463365A

Section VII. MAINTENANCE OF THE LAUNCHING-HANDLING RAIL STOP AND POSITIONING TUBE ASSEMBLY

128. General

This section describes maintenance of the stop and positioning tube assembly (fig. 237). The general precautions described in paragraph 105 must be observed when performing any maintenance on this item.

129. Stop and Positioning Tube Assembly

The stop and positioning tube assembly is located underneath the launching-handling rail.

a. Removal.

- (1) Position the launching-handling rail against the loading rack stops (fig. 56).
- (2) Remove the two rear guard assemblies (fig. 219).
- (3) Remove both rear decelerators (fig. 232) as described in paragraph 122a.

- (4) Disconnect the rod end connector assembly (fig. 237) from the stop and positioning tube assembly.

- (5) Remove the stop and positioning tube assembly.

b. *Disassembly.* Disassemble the stop and positioning tube assembly (fig. 239).

c. *Assembly.* Assemble the stop and positioning tube assembly.

d. Installation.

- (1) Position the stop and positioning tube assembly (fig. 237) on the launching-handling rail and attach the rod end connector assembly.
- (2) Install the rear decelerators (fig. 232) as described in paragraph 122e.
- (3) Install the two rear guard assemblies (fig. 219).

Section VIII. MAINTENANCE OF THE LAUNCHING-HANDLING RAIL HOOK ASSEMBLIES

130. General

This section describes maintenance of the hook assemblies (fig. 218). The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

131. Hook Assemblies

Two hook assemblies (fig. 240) are located beneath and on each side of the four outriggers of the launching-handling rail. Typical removal, disassembly, assembly, and installation procedures are described in a through d below.

a. Removal.

Note. The four decelerators (fig. 218) offer interference to the removal of four of the eight hook assemblies. Perform steps (1) and (2) below if removal of one of these hook assemblies is required.

- (1) Remove the front or rear guard assembly (fig. 219) as required.
- (2) Remove the front or rear decelerator as described in paragraph 122a.

Note. The key numbers shown in parentheses in steps (3) through (7) below refer to figure 240.

- (3) Remove the bumper (2).
- (4) Remove the launching-handling rail as described in paragraph 36c(1).

- (5) Remove the two pins (3) with retaining rings (4).

Note. The two foremost hook assemblies, where applicable, require a shim (7) to insure correct actuation of the elevator warning device. The other six hook assemblies contain a setscrew (5).

- (6) Remove the shim or the setscrew.

- (7) Remove the hook assembly (8).

b. *Disassembly.* Disassemble the hook assembly (fig. 240).

c. *Assembly.* Assemble the hook assembly (fig. 240).

d. Installation.

Note. The key numbers shown in parentheses in steps (1) through (3) below refer to figure 240.

- (1) Attach the shim (7) or install the setscrew (5).
- (2) Position the hook assembly (8) on the launching-handling rail and install the two pins (3) with retaining rings (4).
- (3) Install the bumper (2).
- (4) Install the launching-handling rail as described in paragraph 36c(2).
- (5) Install the decelerator as described in paragraph 122e.
- (6) Install the guard assembly (fig. 219).

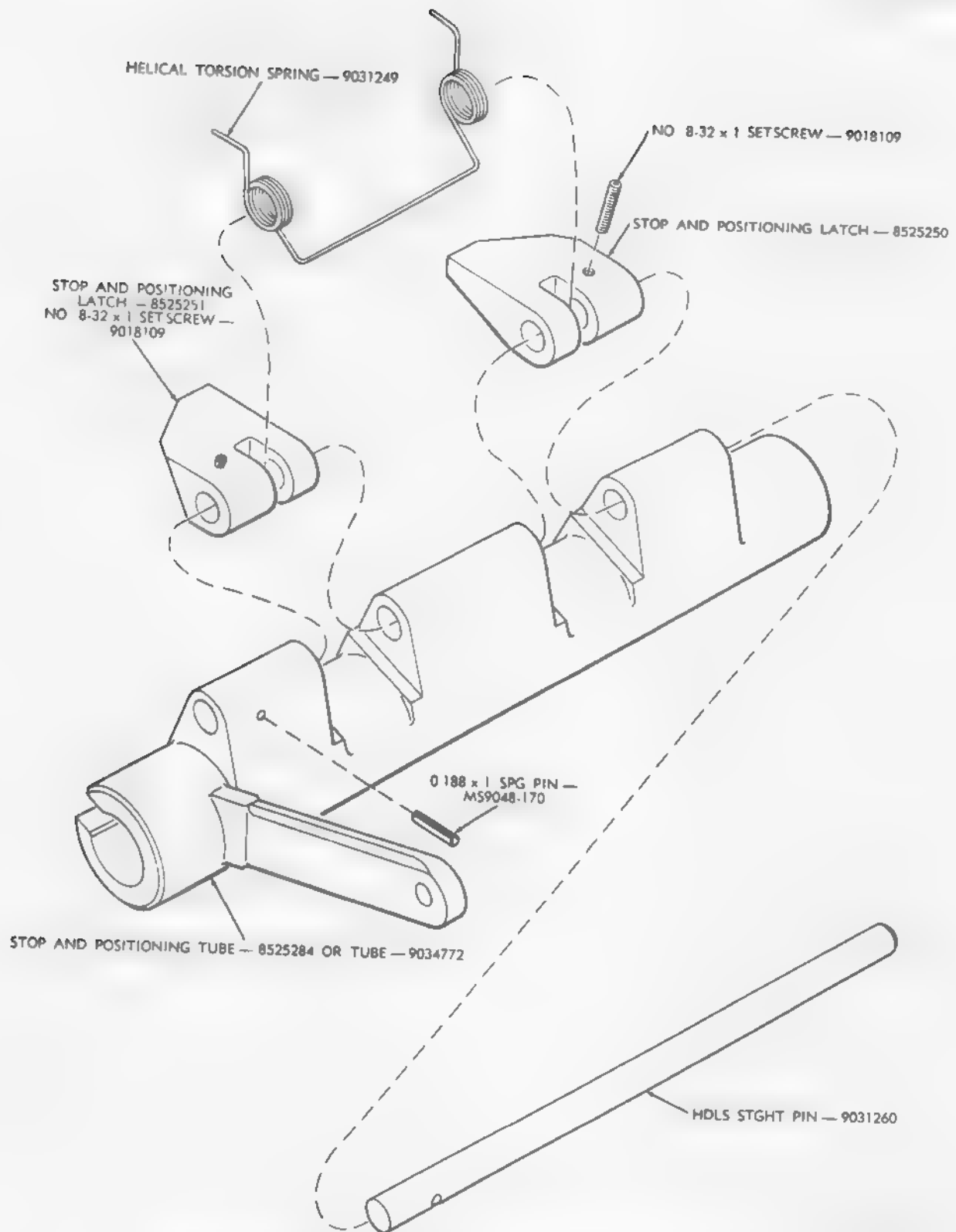
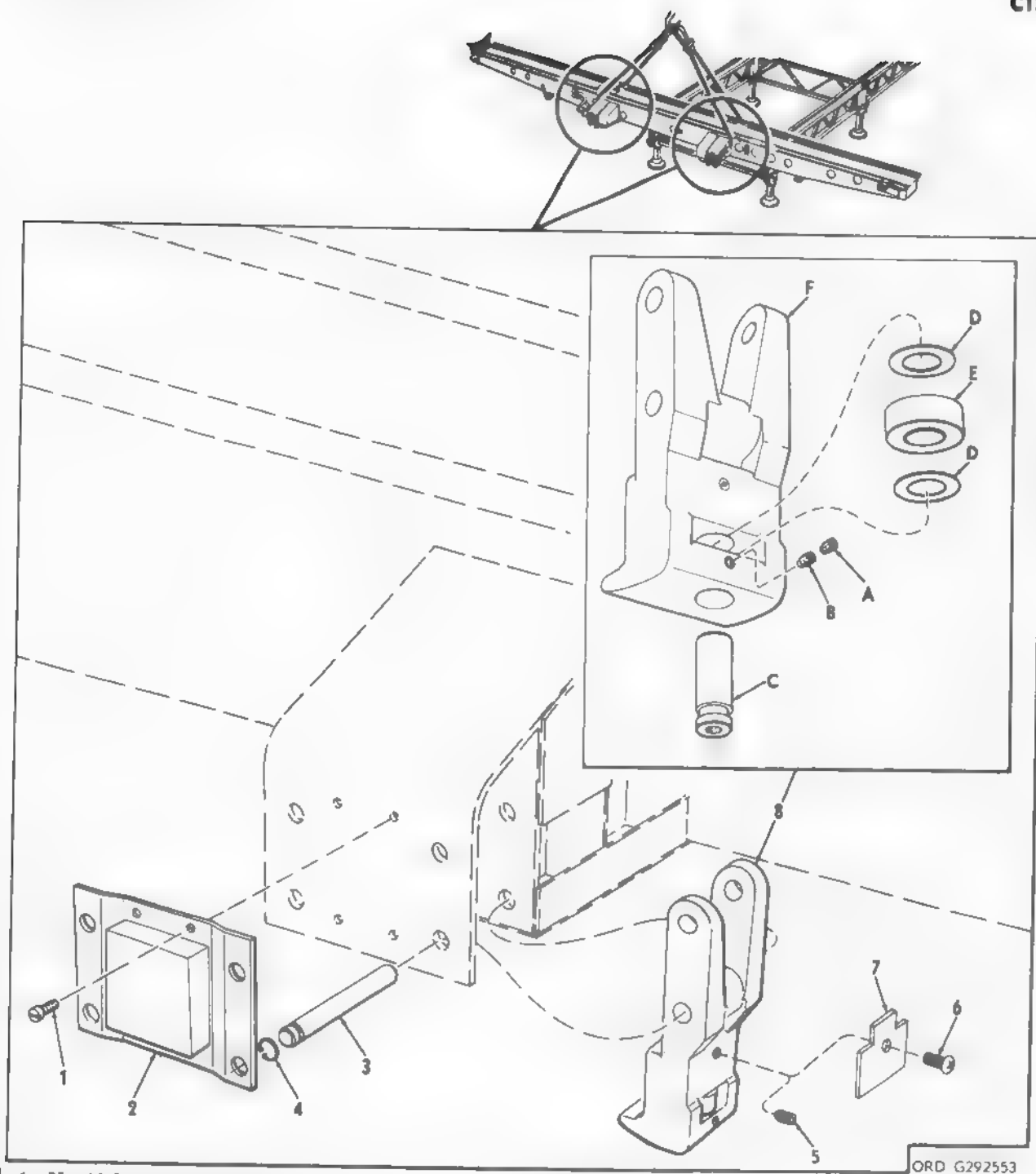


Figure 239. Stop and positioning tube assembly—disassembly and assembly.

RA PD 463735



ORD G292553

- 1—No. 10-24 x 7/16 fl-hd screw (4)
- 2—Bumper
- 3—Pin (2)
- 4—Retaining ring (2)
- 5—1/4-28 x 3/8 fl-pt setscrew¹
- 6—1/4-28 x 5/8 fl-hd screw²
- 7—Shim¹

- 8—Hook assembly
- A—1/4-28 x 3/16 cup-pt setscrew
- B—1/4-28 x 3/8 1/2-dog-pt setscrew
- C—Pin
- D—7/8-id x 1 1/2-od x 0.063 thk fl-washer
- E—Roller
- F—Hook

¹ Used on six hook assemblies² Used on two foremost hook assemblies

Figure 240. Hook assembly—removal, disassembly, assembly, and installation—typical.

Section IX. MAINTENANCE OF LAUNCHING-HANDLING RAIL INCHING DEVICE

132. General

This section describes maintenance of the driver wheel housing assembly (fig. 241), driver wheel assembly, and a handwheel comprising each of the two inching devices (fig. 218). Inching devices are located inside the outriggers at the right front and left rear. The general precautions described in paragraph 105 must be observed when performing any maintenance on these items.

133. Driver Wheel Housing Assembly

Typical procedures for removal and installation of the driver wheel housing assembly are described in *a* through *d* below.

a. Removal.

- (1) Remove launching-handling rail as described in paragraph 36c(1).
- (2) Remove handwheel (fig. 241).
- (3) Remove driver wheel housing assembly.

b. Disassembly. Disassemble the driver wheel housing assembly.

c. Assembly.

- (1) Install two sleeve bearings in a housing.

Caution: Keep the two bearings aligned and avoid burring or chipping.

- (2) Install lubrication fitting in spur gear shaft.
- (3) Assemble remaining parts of housing assembly.

d. Installation.

- (1) Position housing assembly in launching-handling rail.

- (2) Install machine key in keyway of housing assembly.
- (3) Install handwheel.
- (4) Install launching-handling rail as described in paragraph 36c(2).

134. Driver Wheel Assembly

Typical procedures for removal and installation of the driver wheel assembly (fig. 241) are described in *a* and *b* below.

a. Removal.

- (1) Remove the launching-handling rail as described in paragraph 36c(1).
- (2) Remove hook assembly (fig. 240) from driver wheel to be replaced as described in paragraph 131a.
- (3) Remove driver wheel housing assembly (fig. 241) as described in paragraph 133a.
- (4) Remove holder.
- (5) Remove axle and driver wheel assembly.

b. Installation.

- (1) Position driver wheel assembly in launching-handling rail.
- (2) Install axle and holder.
- (3) Install driver wheel housing assembly as described in paragraph 133d.
- (4) Install hook assembly (fig. 240) as described in paragraph 131d.
- (5) Install launching-handling rail as described in paragraph 36c(2).

Section X. MAINTENANCE OF LAUNCHING-HANDLING RAIL IDLER WHEEL ASSEMBLY

135. General

This section describes maintenance of the launching-handling rail idler wheel assemblies

(fig. 242). The general precautions described in paragraph 105 must be observed when performing any maintenance on this item.

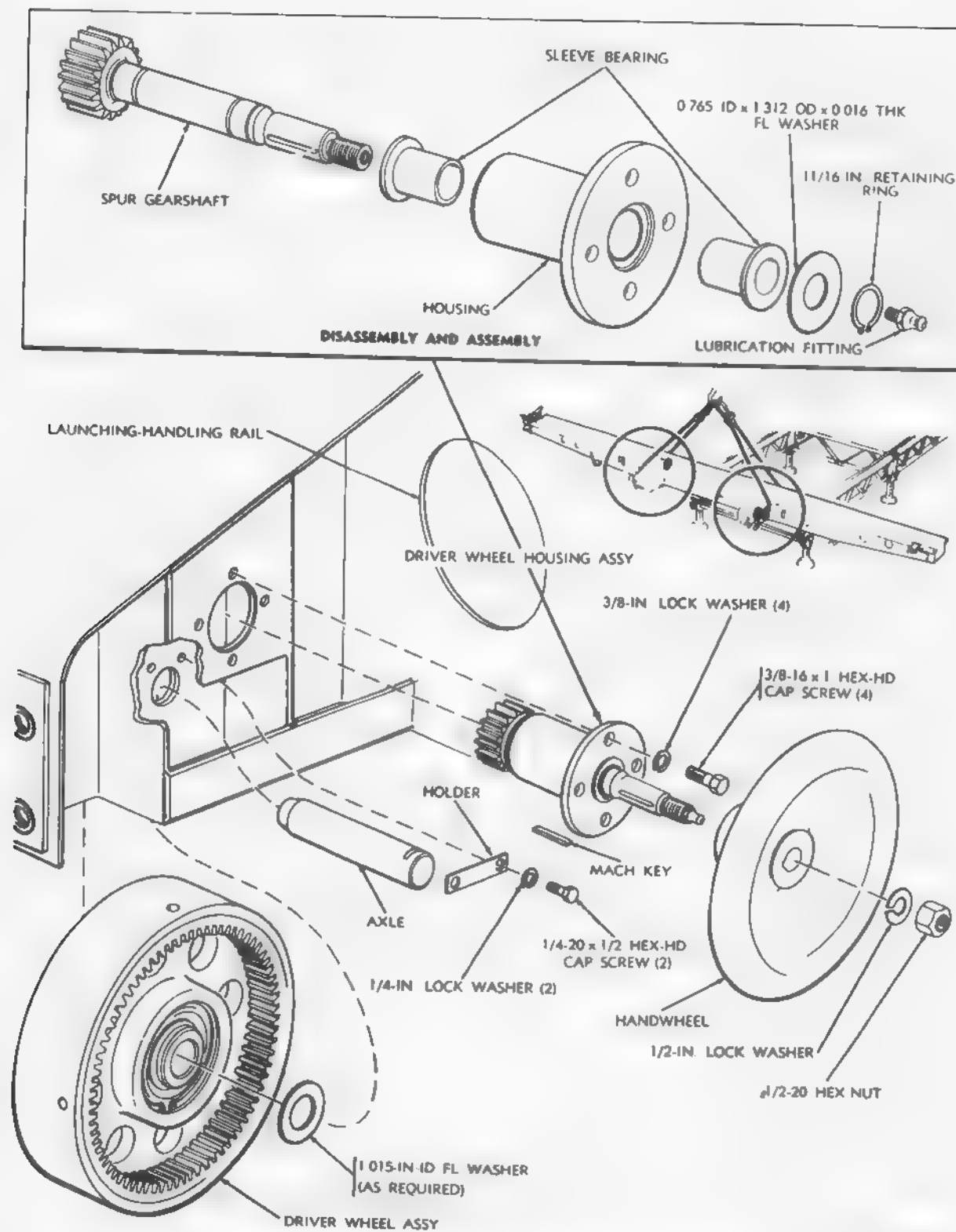


Figure 241. Inching device—removal and installation—typical.

RA PD 463957A

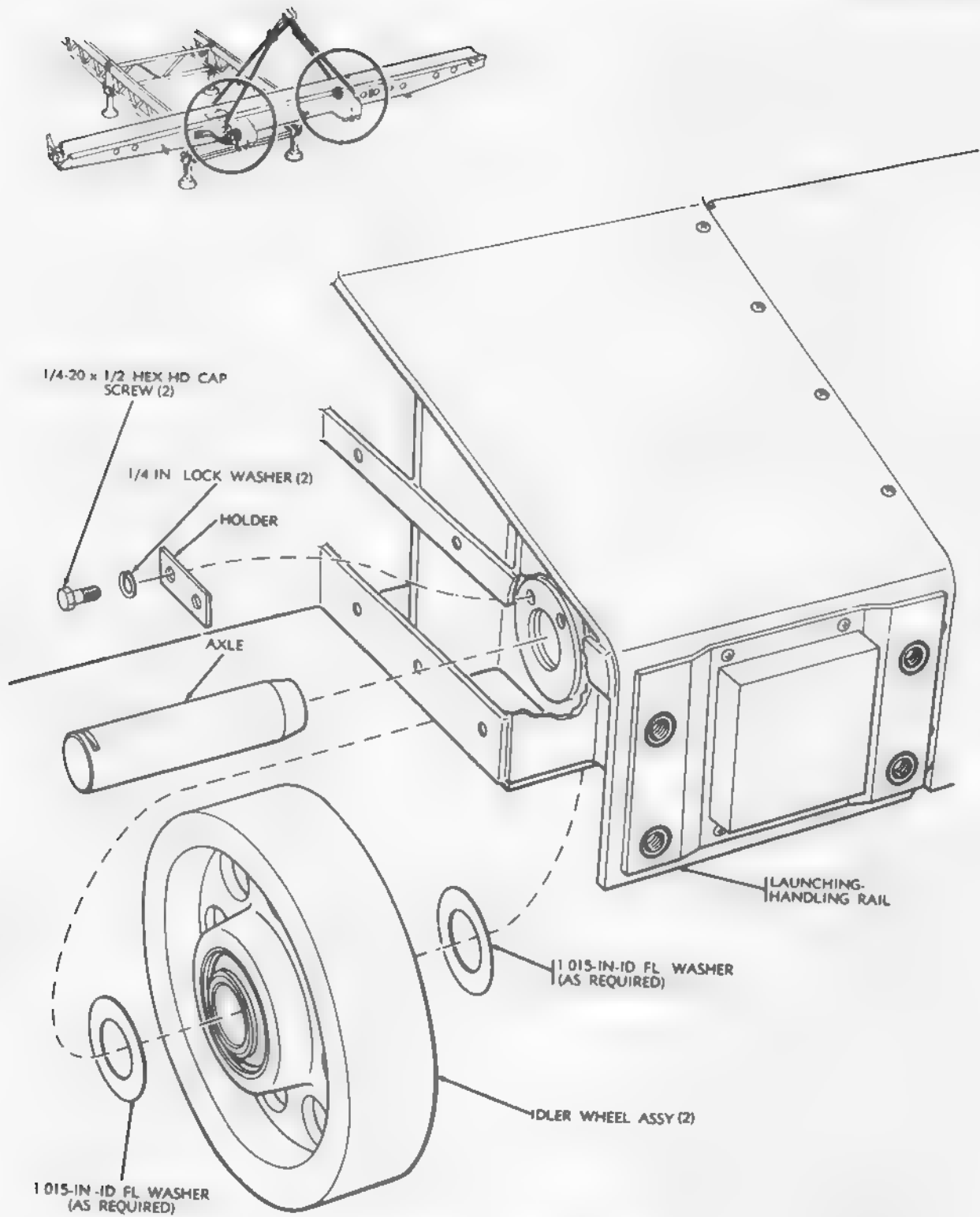


Figure 242. Idler wheel assembly—removal and installation—typical.

RA PD 463958A

136. Idler Wheel Assembly

The idler wheel assemblies are located in the outriggers (fig. 218) at the left front and right rear. Typical procedures for removal and installation of the idler wheel assemblies (fig. 242) are described in *a* and *b* below.

a. Removal.

- (1) Remove launching-handling rail as described in paragraph 36c(1).
- (2) Remove hook assembly (fig. 240) from idler wheel assembly requiring

replacement as described in paragraph 131a.

- (3) Remove idler wheel assembly (fig. 242).

b. Installation.

- (1) Install idler wheel assembly.
- (2) Install hook assembly (fig. 240) as described in paragraph 131d.
- (3) Install launching-handling rail as described in paragraph 36c(2).

Section XI. MAINTENANCE OF RAIL RELEASE ASSEMBLY

137. General

This section describes maintenance of the rail release assembly (fig. 243). The general precautions described in paragraph 105 must be observed when performing any maintenance on this item.

138. Rail Release Assembly

The release assembly is attached to the front end of the launching-handling rail.

Note. The key numbers shown in parentheses in *a* through *d* below refer to figure 243.

a. Removal. Remove release assembly (4).

b. Disassembly.

- (1) Remove cotter pin (4A), two knobs (4B), and washer (4C) from holder (4E).

- (2) Remove holder (4E) from coupling (4P).

- (3) Remove shear bolt (4H) and thumb-screw (4D).

- (4) Remove two setscrews (4J) and two headed straight pins (4K).

- (5) Remove yoke assembly (4L).

- (6) Remove headless straight pin (4N) and two sleeve bushings (4Q) from yoke assembly (4L).

- (7) Remove four sleeve bearings (4M) and two lubrication fittings (4R) from yoke assembly (4L).

- (8) Remove two headless straight pins (4T) from bracket assembly (4CC).

- 1—5/8-11 hex. nut (8)
- 2—5/8-in. lockwasher (8)
- 3—5/8-11 x 2 1/4 hex-hd capcrew (8)
- 4—Rail, release assy
 - A—1/16 x 1 cotter pin
 - B—Nut (2)
 - C—17/32-id x 1 1/16-od fl washer
 - D—Thumbscrew
 - E—Holder
 - F—3/8-24 hex nut
 - G—3/8-in. lockwasher
 - H—3/8-24 x 5.74 shear bolt
- H.1—0.032-in. lockwire
- J—1/4-20 x 5/8 setscrew (2)
- K—Headed str pin (2)
- L—Yoke assy
- M—Sleeve bushing (4)

- N—Hdls str pin
- P—Coupling
- Q—Sleeve bushing
- R—Lubrication fitting (2)
- S—1/8 x 3/4 spg pin (4)
- T—1/2 x 3-3/8 hdls str pin (2)
- U—0.531-id x 1.062-od fl washer (4)
- V—1/4-20 x 5/8 hex-hd capcrew (2)
- W—1/4-in. lockwasher (2)
- X—Release assy housing
- Y—1/8 x 3/4 spg pin
- Z—0.531-id x 1.062-od fl washer
- AA—Spring
- BB—Pin
- CC—Bracket assy
- 5—Launching-handling rail

Figure 243. Rail release assembly—removal and installation—legend.

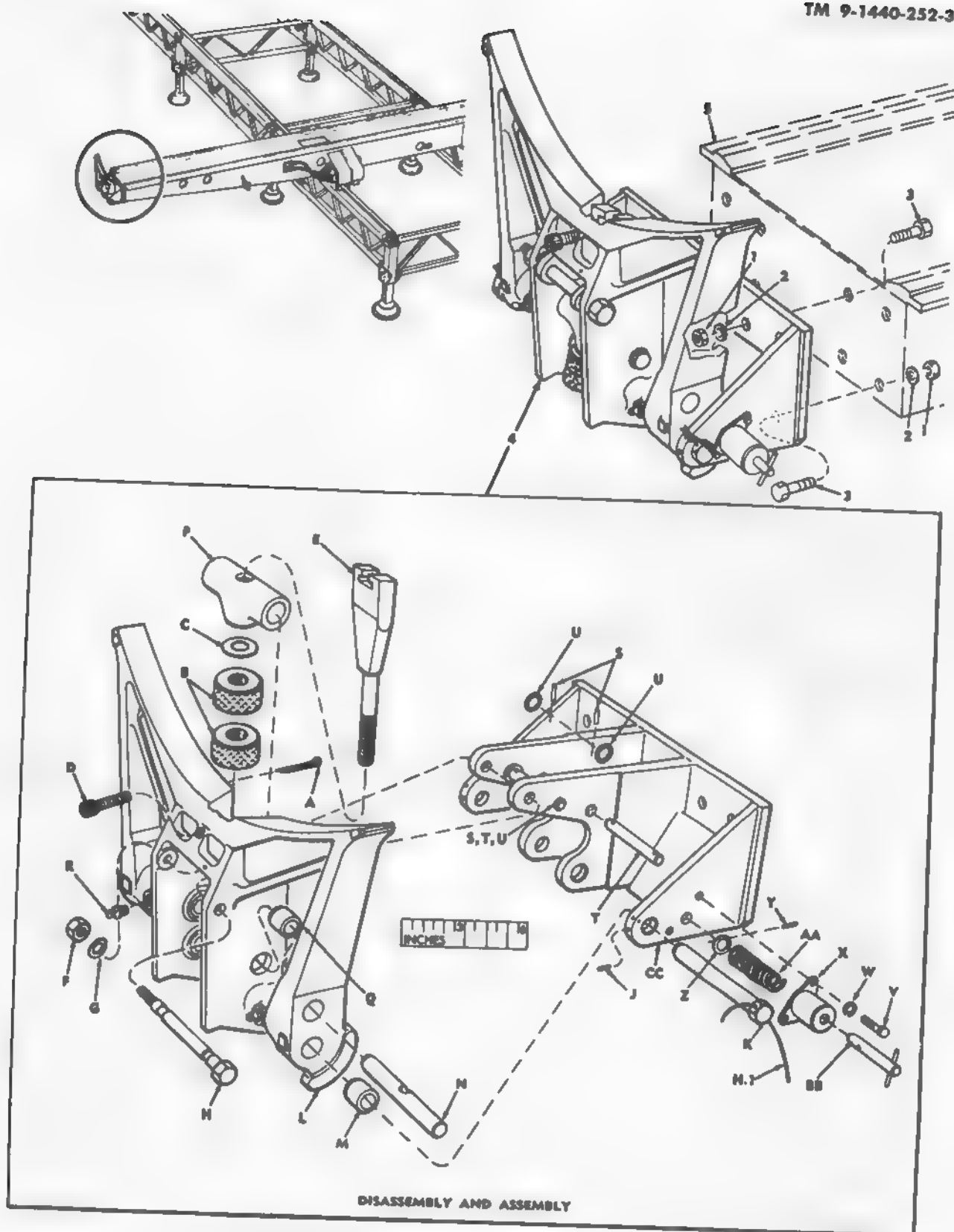


Figure 449. Rail release assembly – removal and installation.

ORD G253826

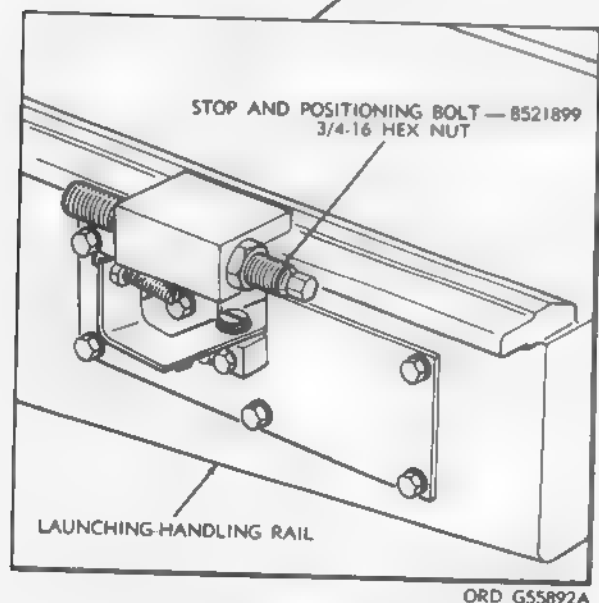
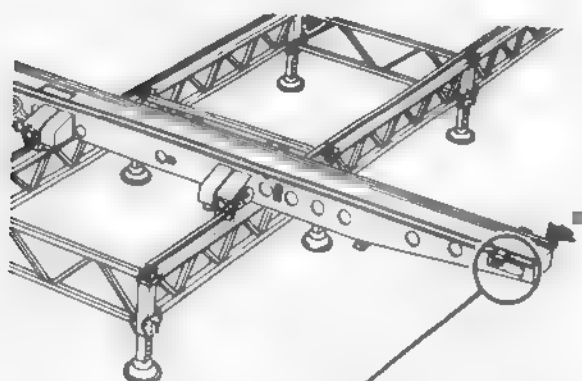
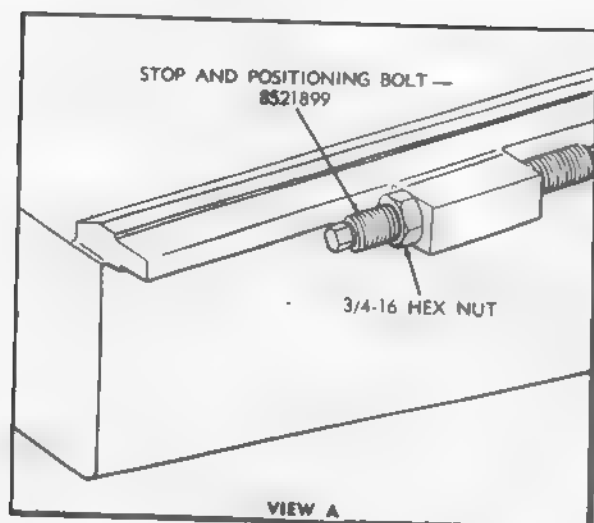


Figure 244. Stop-and-positioning bolt—removal and installation.

- (9) Remove pin, release assembly housing, spring, flat washer, and spring pin from bracket assembly (4CC).

c. Assembly.

- (1) Install two lubrication fittings on yoke assembly (4L).
- (2) Position two headless straight pins in bracket assembly (4CC) and install with four spring pins and four flat washers.
- (3) Position pin in release assembly housing (4X), insert spring and flat washer, and retain these parts by installing spring pin in pin.
- (4) Install release assembly housing on bracket assembly (4CC) with two hexagon-head cap screws and two lockwashers.
- (5) Install four sleeve bearings and two sleeve bushings in yoke assembly (4L).
- (6) Install yoke assembly (4L) on bracket assembly (4CC) with two headed straight pins, and secure pins with setscrews and lockwire.
- (7) Position coupling on yoke assembly (4L) and install headless straight pin.
- (8) Rotate pin and install holder (4E).
- (9) Install flat washer, two knobs, and cotter pin on holder (4E).
- (10) Install shear bolt on yoke assembly (4L) with lockwasher and hexagon nut.
- (11) Install thumbscrew on yoke assembly (4L).

d. Installation.

- (1) Position rail release assembly (4) on launching-handling rail (5) and secure top of release assembly to rail with hexagon-head cap screws (3), lockwashers (2), and hexagon nuts (1).
- (2) Secure bottom of release assembly (4) to rail (5) with hexagon-head cap screws (3), lockwashers (2), and hexagon nuts (1).
- (3) Torque hexagon nuts at top of release assembly and hexagon-head cap screws at bottom of release assembly to 1,100 pound-inches.

139. Stop-and-Positioning Bolt

A stop and positioning bolt (fig. 241) is installed on each side of the launching-handling rail for the purpose of properly aligning the rocket motor cluster on the rail. Refer to TM 9-1410-250-12/1 for adjustment of bolt.

140. Stop-and-Positioning Latch

Stop and positioning latches are installed under the launching-handling rail; one is on the rear of the forward outrigger and the other is on the front of the rear outrigger for the purpose of securing the position of the launching-handling rail on the storage rack and aligning it on the erecting beam. Refer to TM 9-1410-250-12/1 for adjustment of latches

Section XII. MAINTENANCE OF GUIDANCE SET COOLING SYSTEM**141. General**

This section covers maintenance of the guidance set cooling system. The general precautions described in paragraph 105 must be observed when performing any maintenance on this system.

142. Guidance Set Cooling System*a. Removal of Guidance Set Cooling System.*

Note. The key numbers shown in parentheses in (1) through (4) below refer to figure 244.1.

- (1) Remove cover (3).
- (2) Remove blower assembly and mount group (9) as described in paragraph 114.1a (2) through (4).
- (3) Remove hose (8).
- (4) Remove mounts (9C).

Note. The key numbers shown in parentheses in (5) through (7) below refer to figure 244.2.

- (5) Remove hose assembly (4).

- (6) Remove mounting plate (12) and pipe (13).

- (7) Remove bracket (17).

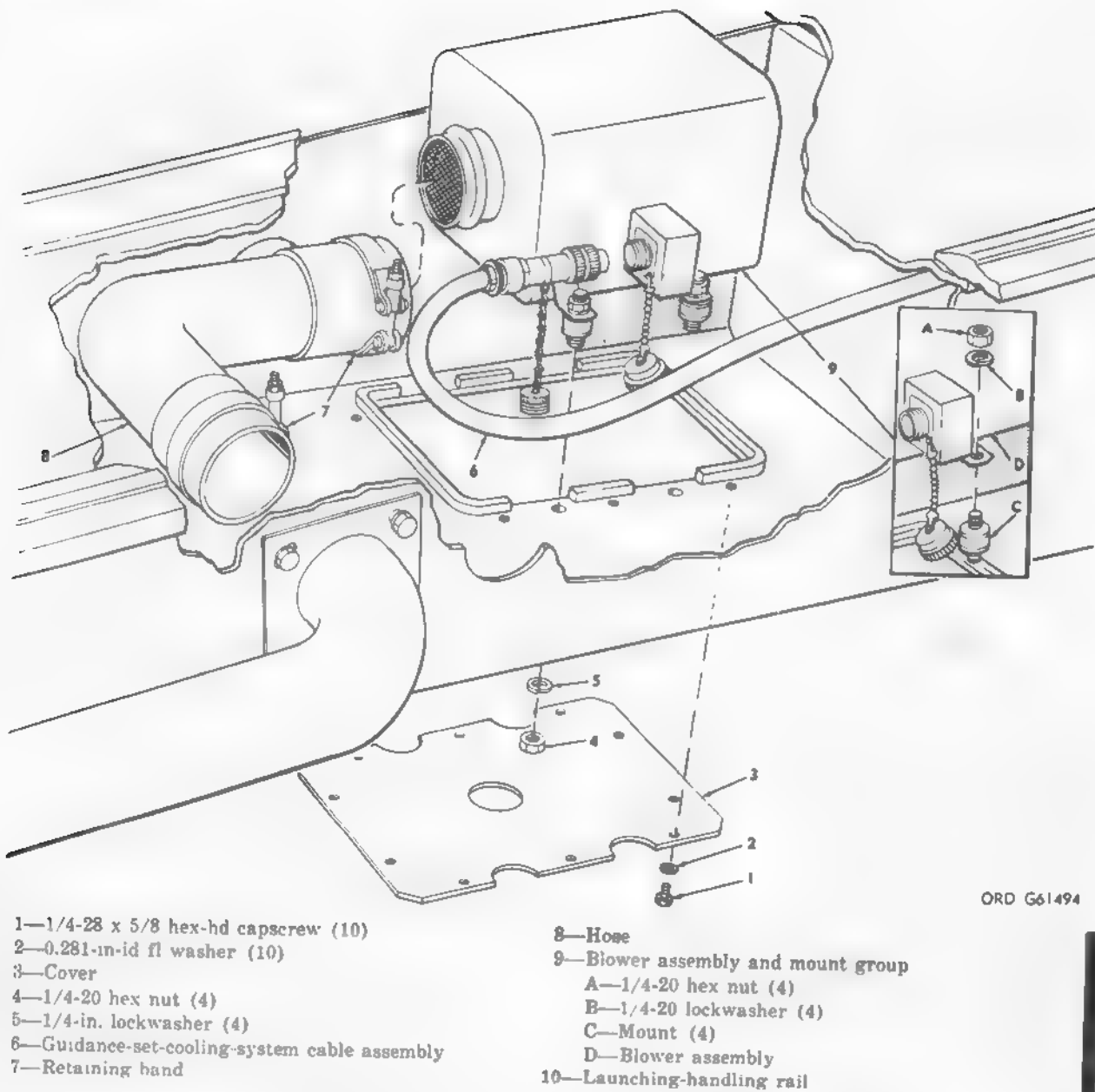
b. Installation of Guidance Set Cooling System.

Note. The key numbers shown in parentheses in (1) through (3) below refer to figure 244.2.

- (1) Install bracket (17).
- (2) Install pipe (13) and mounting plate (12).
- (3) Install hose assembly (4).

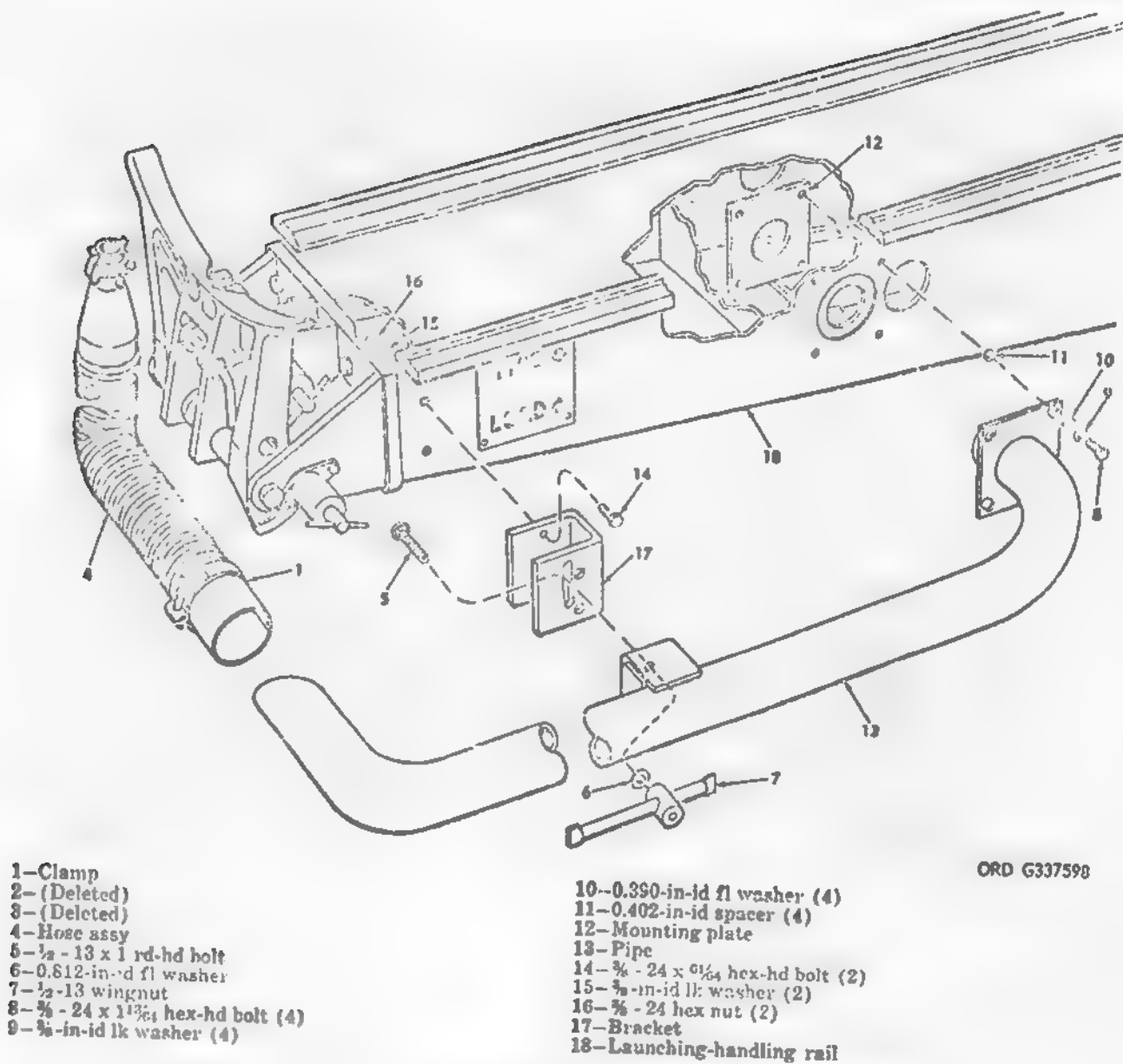
Note. The key numbers shown in parentheses in (4) through (7) below refer to figure 244.1.

- (4) Install mounts (9C) on blower assembly (9D).
- (5) Position hose (8) inside launching-handling rail (10).
- (6) Install blower assembly and mount group (9) as described in paragraph 114.1b (5) through (7).
- (7) Install cover (3).



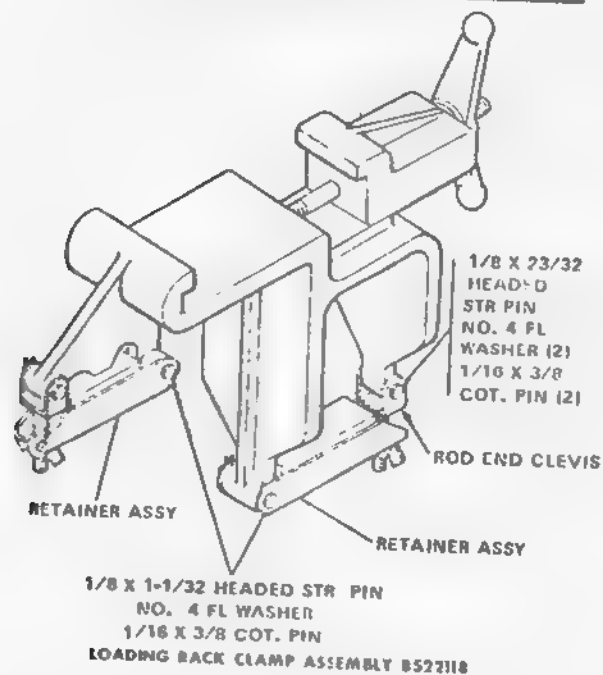
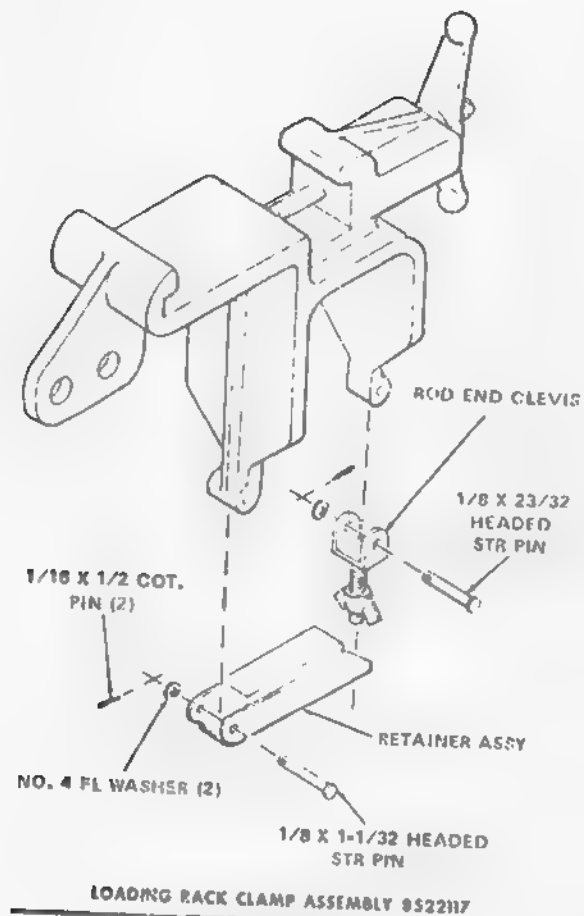
ORD G61494

Figure 244.1. Guidance-set cooling system—removal and installation.



ORD G337598

Figure 244.2. Guidance set cooling system—removal and installation—Continued.



MI 37954

Figure 264. Loading rack clamp assemblies —
disassembly and assembly.

Next figure no. is 267.

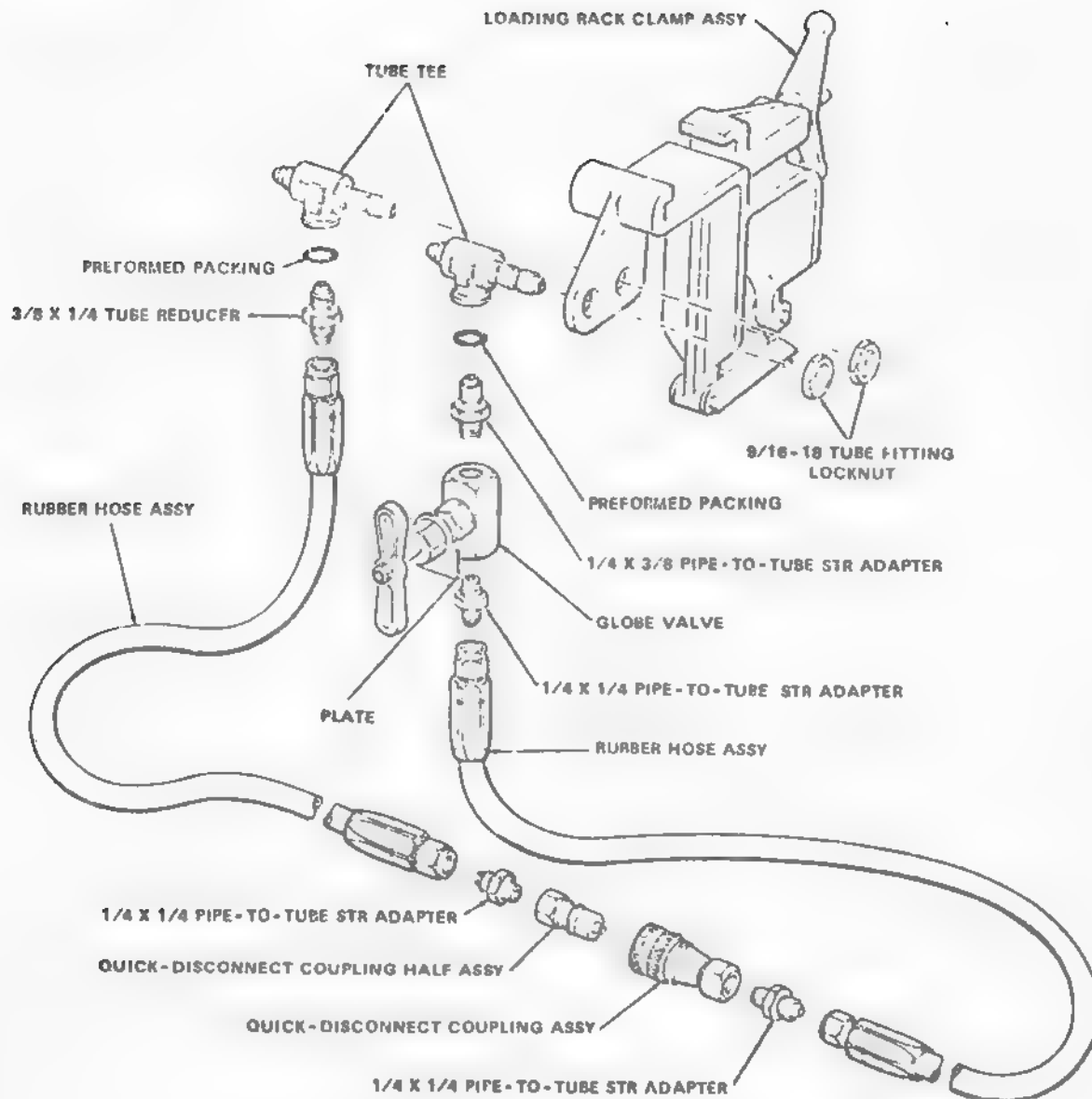
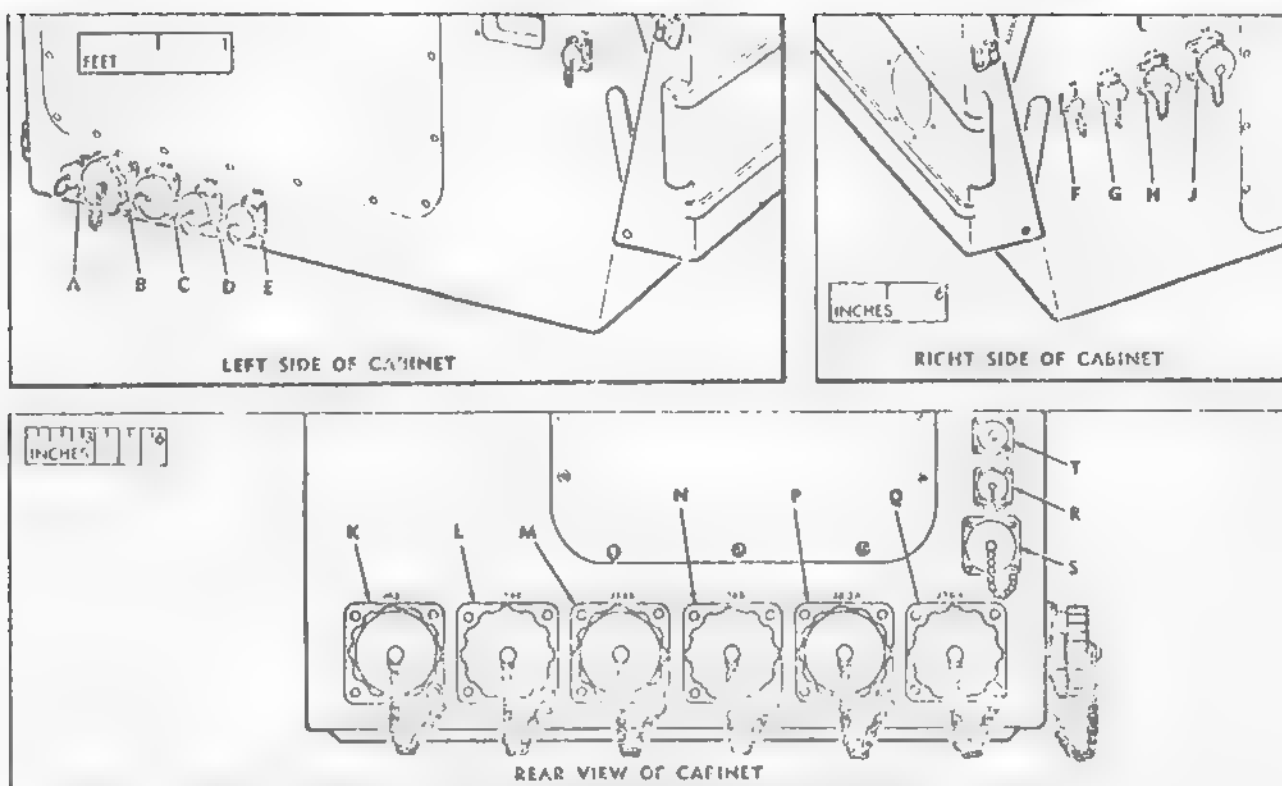


Figure 267. Test station valve assembly — partial disassembly and assembly.

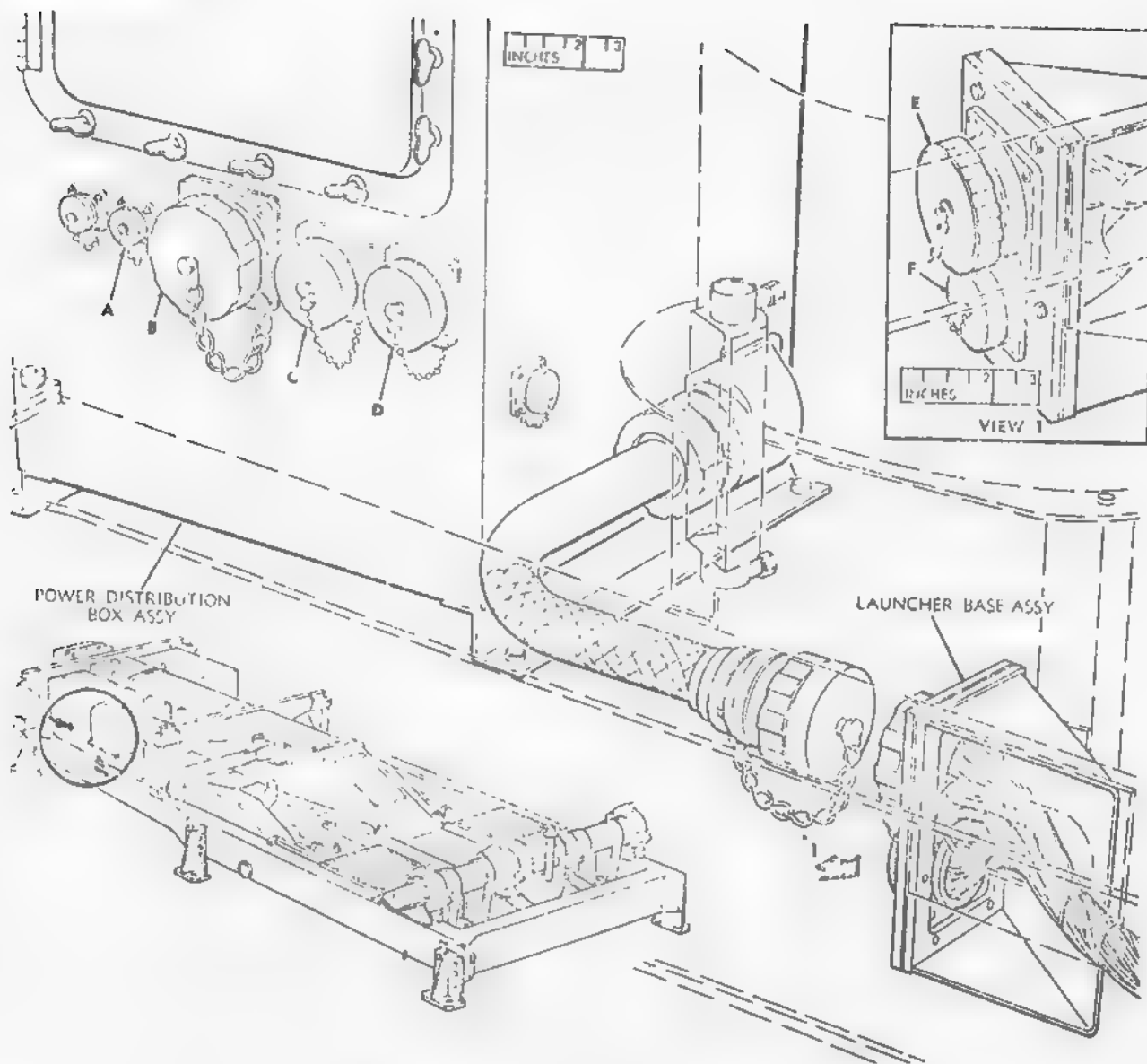
Next figure no. is 270.



KEY	RECEPTACLE CONNECTOR	CONNECTED TO RECEPTACLE CONNECTOR	ON EQUIPMENT
A	J88A	J90G	LAUNCHING SECTION CONTROL INDICATOR
B	J5A	J4A	LAUNCHING SECTION CONTROL INDICATOR
C	J81B	J81A	LAUNCHER BASE (NO 4)
		J81A	LAUNCHER BASE (NO 2 AND 3)
		J81A	LAUNCHER BASE (NO 1)
D	J69A	J69B	POWER DISTRIBUTION BOX (LCNR NO 4)
		J69B	POWER DISTRIBUTION BOX (LCNR NO 2 AND 3)
		J69B	POWER DISTRIBUTION BOX (LCNR NO 1)
E	J69D	J69C	POWER DISTRIBUTION BOX (LCNR NO 4)
		J69C	POWER DISTRIBUTION BOX (LCNR NO 2 AND 3)
		J69C	POWER DISTRIBUTION BOX (LCNR NO 1)
F	J14A		BURST TEST
G	J13A		TEST EQUIPMENT POWER
H	J91A		TELEMETRY
J	J7B		UTILITY POWER
K	J87C		TEST STATION
L	J70C		TEST STATION
M	J83B		TEST STATION
N	J70B		TEST STATION
P	J83A		TEST STATION
Q	J70A		TEST STATION
R	J12B		LOUDSPEAKER
S	J45A		LIFT AND DOOR CONTROL PANEL
T	J123A		WARNING HORN

ORD G61276

Figure 270. Receptacle connectors of the launcher control-indicator.

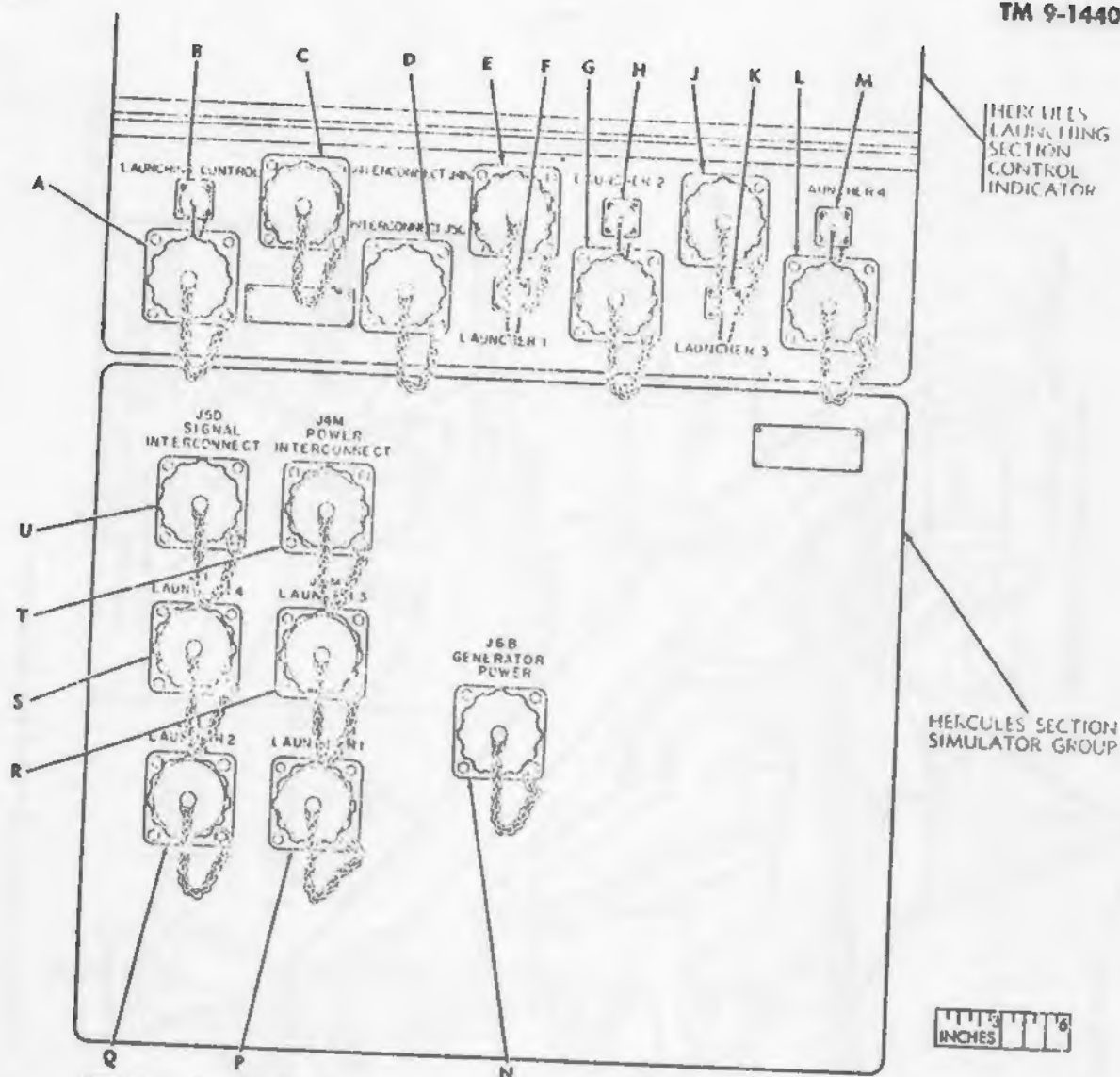


KEY	RECEPTACLE CONNECTOR	CONNECTED TO RECEPTACLE CONNECTOR	ON EQUIPMENT
A	J12A	P12A	LOUDSPEAKER
B	J6A	J1	HERCULES SECTION SIMULATOR GROUP
C	J69C	J69D	LAUNCHER CONTROL INDICATOR NO 4
		J69D	LAUNCHER CONTROL INDICATOR NO 2 & 3
		J69D	LAUNCHER CONTROL INDICATOR NO 1
D	J69B	J69A	LAUNCHER CONTROL INDICATOR NO. 4
		J69A	LAUNCHER CONTROL INDICATOR NO 2 & 3
		J69A	LAUNCHER CONTROL INDICATOR NO 1
E	J80A	P80A	POWER DISTRIBUTION BOX
F	J81A	J81B	LAUNCHER CONTROL INDICATOR NO 4
		J81B	LAUNCHER CONTROL INDICATOR NO 2 & 3
		J81B	LAUNCHER CONTROL INDICATOR NO 1

ORD G55665

Figure 271. Power distribution box assembly and launcher base assembly - receptacle connectors.

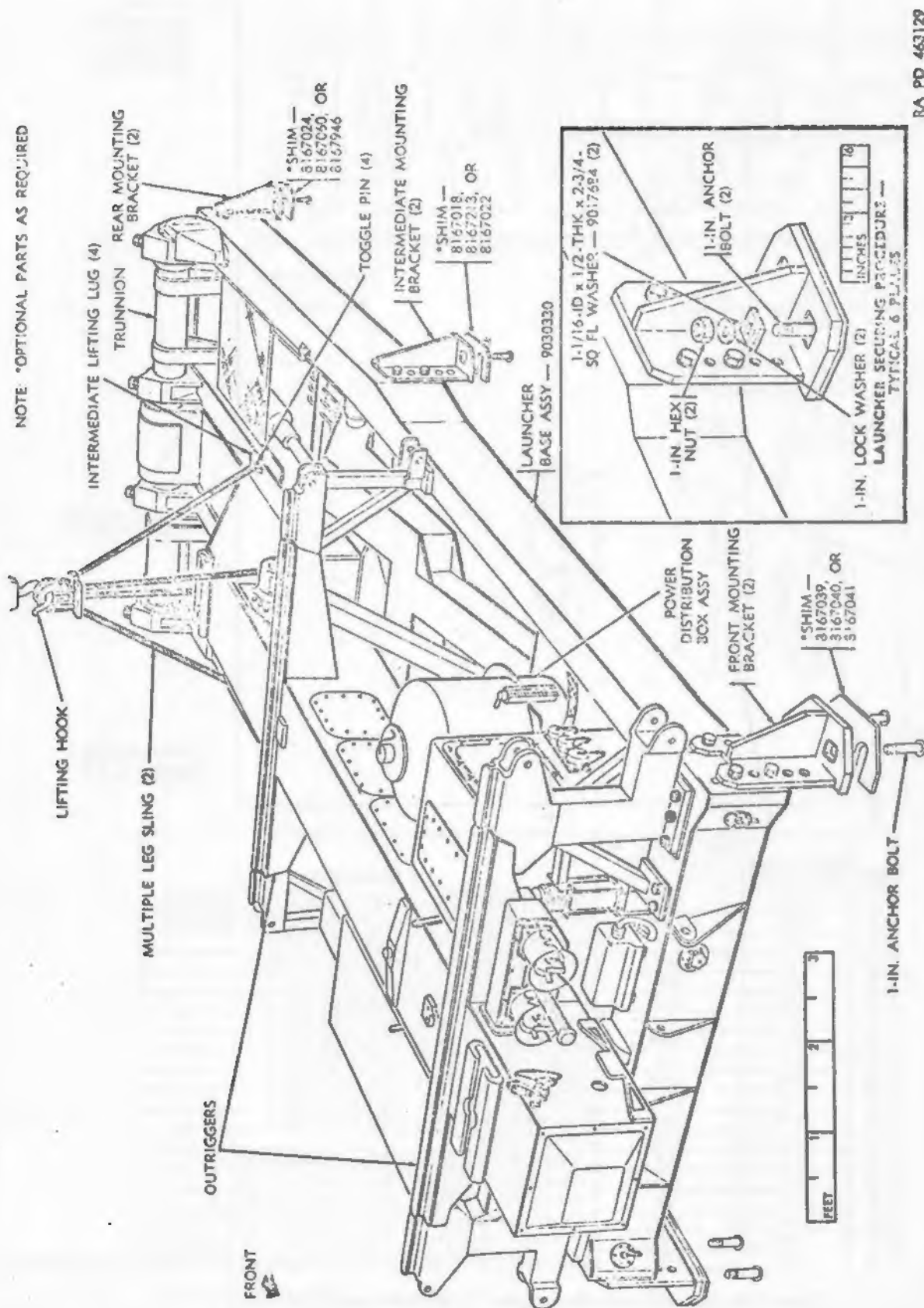
Next figure no. is 279.



KEY	RECEPTACLE CONNECTOR	CONNECTED TO RECEPTACLE CONNECTOR	ON EQUIPMENT
A	J5B	J4H	TRAILER-MOUNTED LAUNCHING CONTROL STATION
B	J88B	J92A	TRAILER-MOUNTED LAUNCHING CONTROL STATION
C	J4N	J5D	HERCULES SECTION SIMULATOR GROUP
D	J5C	J4M	HERCULES SECTION SIMULATOR GROUP
E	J4D	J5A	LAUNCHER CONTROL INDICATOR NO 1
F	J90E	J88A	LAUNCHER CONTROL INDICATOR NO 1
G	J4E	J5A	LAUNCHER CONTROL INDICATOR NO 2
H	J90F	J88A	LAUNCHER CONTROL INDICATOR NO 2
J	J4F	J5A	LAUNCHER CONTROL INDICATOR NO 3
K	J90G	J88A	LAUNCHER CONTROL INDICATOR NO 3
L	J4G	J5A	LAUNCHER CONTROL INDICATOR NO 4
M	J90H	J88A	LAUNCHER CONTROL INDICATOR NO 4
N	J6B	J1H	POWER SOURCE
P	J1K	J6A	POWER DISTRIBUTION BOX (LAUNCHER NO 1)
Q	J1L	J6A	POWER DISTRIBUTION BOX (LAUNCHER NO 2)
R	J1M	J6A	POWER DISTRIBUTION BOX (LAUNCHER NO 3)
S	J1N	J6A	POWER DISTRIBUTION BOX (LAUNCHER NO 4)
T	J4M	J5C	HERCULES LAUNCHING SECTION CONTROL INDICATOR
U	J5D	J4N	HERCULES LAUNCHING SECTION CONTROL INDICATOR

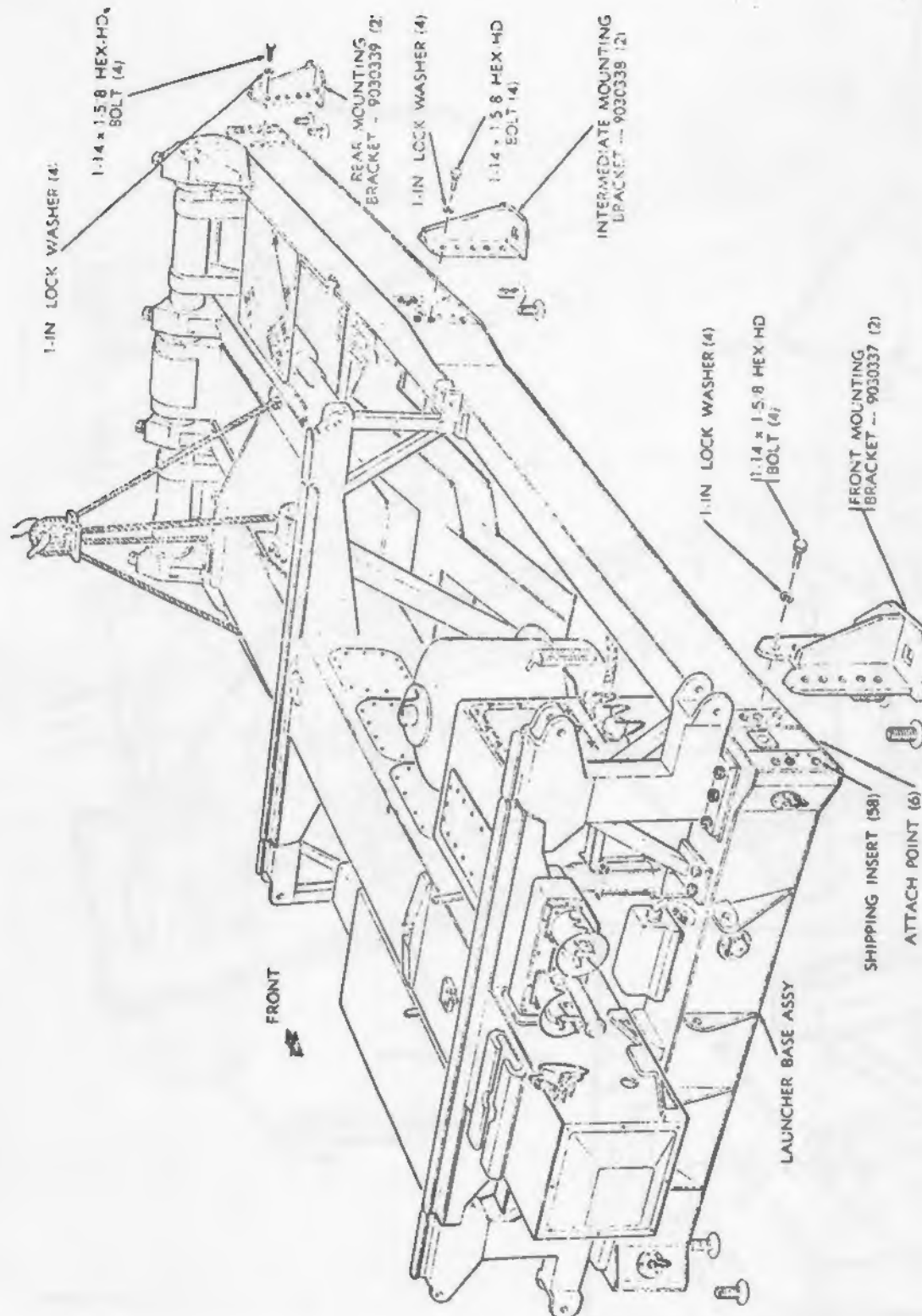
Figure 279. Hercules launching section control-indicator and Hercules section simulator group - receptacle connectors.

ORD G55666



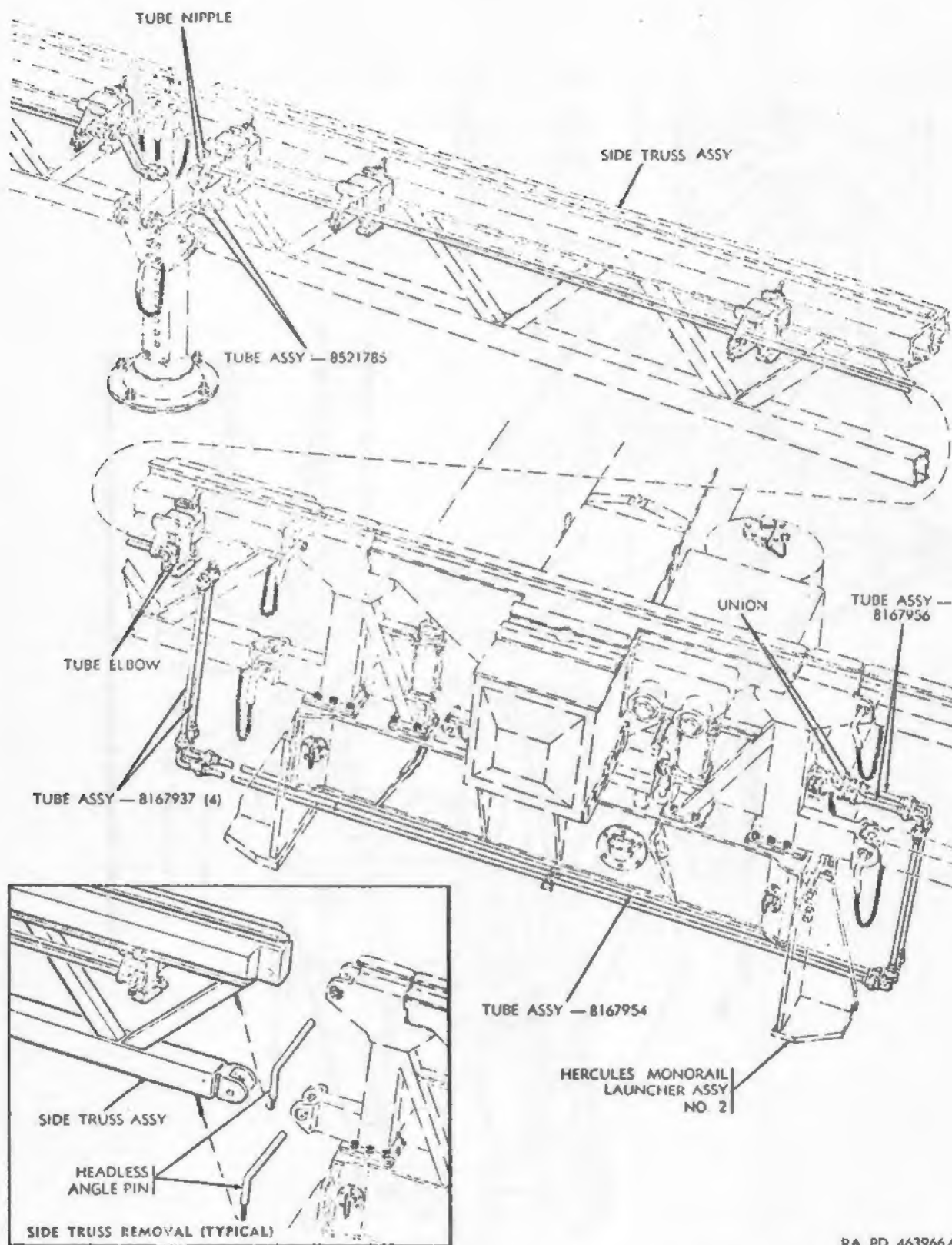
RA PD 463129

Figure 287. Mounting brackets -- Removal and installation.



RA PD 463366A

Figure 288. Mounting brackets—removal and installation—continued.



RA PD 463966A

Figure 289. Mounting brackets—removal and installation—continued.